

JVC

SERVICE MANUAL

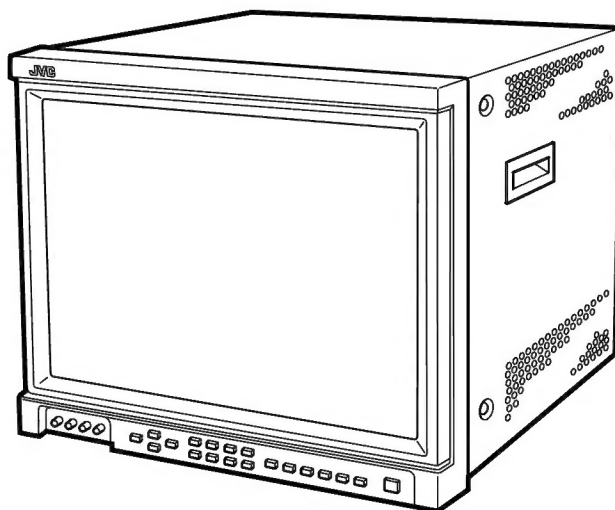
MULTI-FORMAT MONITOR

BASIC CHASSIS

R1

DT-V1700CG (E)

IF-C01PNG [OPTION]
IF-C01COMG [OPTION]



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SPECIFICATIONS

Items	Contents
Type	Multi-format monitor
Picture Tube	17" measured diagonally
Screen Size (Width × Height × Diagonally)	13" (330mm) × 9-7/8" (250mm) × 16-1/4" (410mm)
Frequency	
Horizontal	15kHz/15kHz – 45kHz
Vertical	50Hz – 100Hz
Video Band	
Component	25MHz (-3dB)
Video (Y/C)	8MHz (-3db)
Horizontal Resolution	
1080/60i	800 TV lines
Video (Y/C)	600 TV lines
Input Terminals	Installing an optional input card in SLOT1, 2, or 3 is required. INPUT A/INPUT B : Terminals on the input card in SLOT1. INPUT C/INPUT D : Terminals on the input card in SLOT2. INPUT E/INPUT F : Terminals on the input card in SLOT3.
Compliant Video Signal	NTSC/PAL (using the IF-C01PNG) 480i/480p/576i/720p/1080i(60Hz/24pSF) (using the IF-C01COMG) D1 serial digital (using the IF-C01SDG)
Remote Inputs	Point-of-contact connection, 1 line, D-sub connector (15-pin 3-line) Serial connection, 1 line, D-sub connector (9-pin), compliant to RS-232C
Audio Output	1W (monaural) 3-1/8" (8cm) round speaker ×1
Environmental Conditions	
Operating Temperature	5°C – 35°C (41°F – 95°F)
Operating humidity	20% – 80% (non-condensing)
Power Requirements	230V AC, 50Hz/60Hz
Power Consumption	0.9A (not including input card) Max. 1.0A (including input card)
Dimensions (width × Height × Depth)	15-5/8"(395mm) × 13-1/4"(334mm) × 18-3/8"(466.5mm) (not including wide mask and input card)
Weight	51.0 lbs (23.2kg) (not including wide mask and input card)
Accessory	AC Power cord [7.9ft (2.4m)] × 1

* [OPTIONS] For the specifications of the IF-C01PNG(NTSC/PAL Video Input Card) and the IF-C01COMG (Component/RGB Input Card), see the OPERATING INSTRUCTIONS.

SAFETY PRECAUTIONS

1. The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. **Electrical components having such features are identified by shading on the schematics and by (Δ) on the parts list in Service manual.** The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may cause shock, fire, or other hazards.
4. **Use isolation transformer when hot chassis.**
The chassis and any sub-chassis contained in some products are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some products when the HOT chassis is exposed.
5. **Don't short between the LIVE side ground and ISOLATED (NEUTRAL) side ground or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE : ($\perp$) side GND, the ISOLATED(NEUTRAL) : (⏏) side GND and EARTH : ($\oplus$) side GND. Don't short between the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND and never measure the LIVE side GND and ISOLATED(NEUTRAL) side GND or EARTH side GND at the same time with a measuring apparatus (oscilloscope etc.).
If above note will not be kept, a fuse or any parts will be broken.
6. If any repair has been made to the chassis, it is recommended that the B1 setting should be checked or adjusted (See ADJUSTMENT OF B1 POWER SUPPLY).
7. The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause an increase in X-Ray emission, arcing and possible component damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
8. Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10k Ω 2W resistor to the anode button.
9. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.

10. Isolation Check

(Safety for Electrical Shock Hazard)

After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

(1) Dielectric Strength Test

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 1100V AC (r.m.s.) for a period of one second.

(... Withstand a voltage of 1100V AC (r.m.s.) to an appliance rated up to 120V, and 3000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.)

This method of test requires a test equipment not generally found in the service trade.

(2) Leakage Current Check

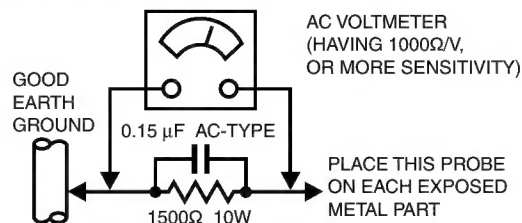
Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

However, in tropical area, this must not exceed 0.2mA AC (r.m.s.).

● Alternate Check Method

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1000 ohms per volt or more sensitivity in the following manner. Connect a 1500 Ω 10W resistor paralleled by a 0.15 μ F AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.). Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).

However, in tropical area, this must not exceed 0.3V AC (r.m.s.). This corresponds to 0.2mA AC (r.m.s.).



11. High voltage hold down circuit check.

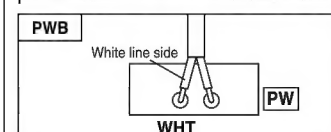
After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly.

See "X-RAY PROTECTOR ADJUSTMENT/CHECK" on page 43.

This mark shows a fast operating fuse, the letters indicated below show the rating.



POWER CORD REPLACEMENT WARNING
Connecting the white line side of power cord to "WHT" character side.

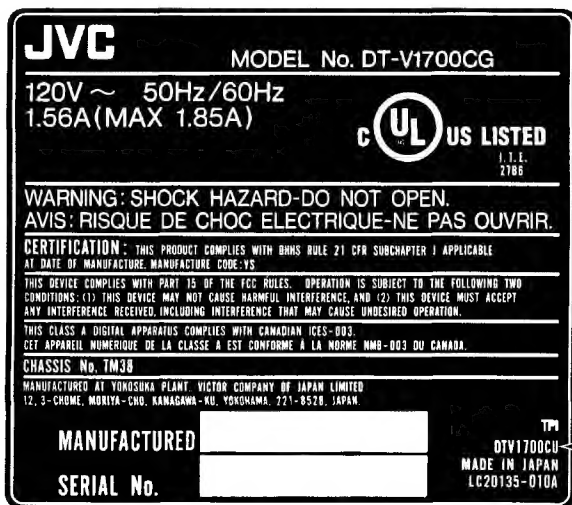


HOW TO IDENTIFY MODELS

This manual is used for the DT-V1700CG (E) model.

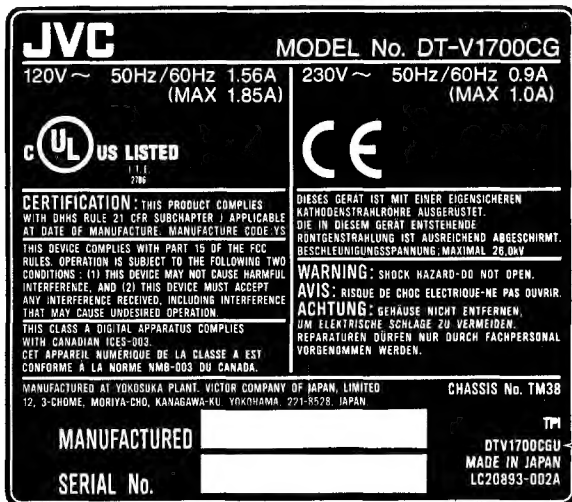
Please check the destination and the version of your model by RATING LABEL.

■ DT-V1700CU [FOR NORTH AMERICA MODEL (INITIAL PRODUCT)]



INDICATED "DTV1700CU"

■ DT-V1700CGU [FOR NORTH AMERICA MODEL]



INDICATED "DTV1700CGU"

■ DT-V1700CGE [FOR EUROPE AND ASIA MODELS]



INDICATED "DTV1700CGE"

SERVICE NOTE :

[illegible]

SPECIFIC SERVICE INSTRUCTIONS

DISASSEMBLY PROCEDURE

■ CAUTION

Some parts are active even after the main power switch is set to OFF.

Be sure to unplug the power cord from the power outlet before proceeding with disassembly or assembly of the unit.

■ REMOVING THE SLOT PANEL, TOP COVER AND REAR PANEL

1. Unplug the power cord, remove the six screws ① and remove the Slot Panel.
2. Remove the fourteen screws ② and then the two screws ③.
3. Open up the lower part of the Top Cover slightly. Then pull the Top Cover toward the rear and lift to remove it.
4. Also remove the Rear Panel.

■ REMOVING THE BOTTOM COVER

- Remove the Slot Panel, Top Cover and Rear Panel before proceeding to the following.
1. Place the unit so that the side with the Slot Chassis comes at the bottom.
 2. Remove the six screws ④ and pull the bottom cover toward the rear to remove it.

■ REMOVING THE SIGNAL PW BOARD, MOTHER PW BOARD AND REMOTE PW BOARD

- Remove the Slot Panel, Top Cover and Rear Panel before proceeding to the following.
1. Disconnect the wire clamps and connectors as required.
 2. Remove the four screws ⑤ and unplug the Signal PWB from the connector on the Mother PWB.
 3. Remove the two screws ⑥ and then remove the joint bracket.
 4. Remove the two screws ⑦ and then remove the Slot Chassis by lifting it while pushing the claw ⑧ on the Chassis Base.
 5. Remove the nine screws ⑧ and remove the Mother PWB.
 6. Remove the screw ⑨, the two screwnuts ⑩ and the two screwnuts ⑪, then remove the Remote PWB.

■ REMOVING THE CHASSIS BASE AND SPEAKER

- Remove the Slot Panel, Top Cover, Rear Panel and Slot Chassis before proceeding to the following.
1. Disconnect the wire clamps and connectors as required.
 2. Remove the two screws ⑫ and pull the chassis base toward the front to remove it.
 3. While disengaging the claw ⑬ on the chassis base that is engaged with the rear of the speaker, lift the speaker to remove it (see Fig. 2).

■ REMOVING THE SIDE BRACKETS, CRT AND TALLY PW BOARD

- Remove the Slot Panel, Top Cover, Rear Panel, Bottom Cover, Slot Chassis and Chassis Base before proceeding to the following.
1. Remove the four screws ⑭ and remove the Side Brackets.
 2. Also remove the CRT.
 3. Remove the two screws ⑮ and remove the Tally PWB.

■ REMOVING THE FRONT CONTROL PW BOARD AND FRONT VR PW BOARD

1. Remove the five screws ⑯ and remove the Control Base.
2. Disconnect the connectors as required.
3. Remove the three screws ⑰ and remove the Front Control PWB.
4. While slightly lifting the two claws ⑱ on the Control Base, remove the Front VR PWB.

■ DIAGNOSING THE MAIN PW BOARD

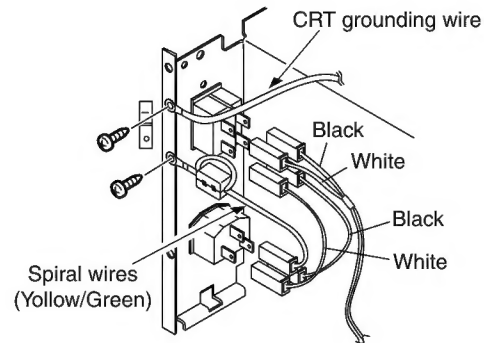
1. Remove the Slot Panel, Top Cover and Rear Panel.
2. Place the unit so that the side with the Slot Chassis comes at the bottom, and remove the Bottom Cover.
3. Now the diagnosis of the Main PWB is possible.

* The unit is unstable when it is placed on its side so please be careful that it does not topple over during work.

* Before turning the power on, ensure that the connectors including the CRT grounding are connected properly.

CAUTION

Before turning the power on, ensure that the spiral wires (Yellow/Green) and the CRT grounding wires are connected properly.



View from the rear of the AC inlet

■ NOTE CONCERNING WIRE CLAMPING

- Be sure to reconnect the wire clamps that have been disconnected during the above work.

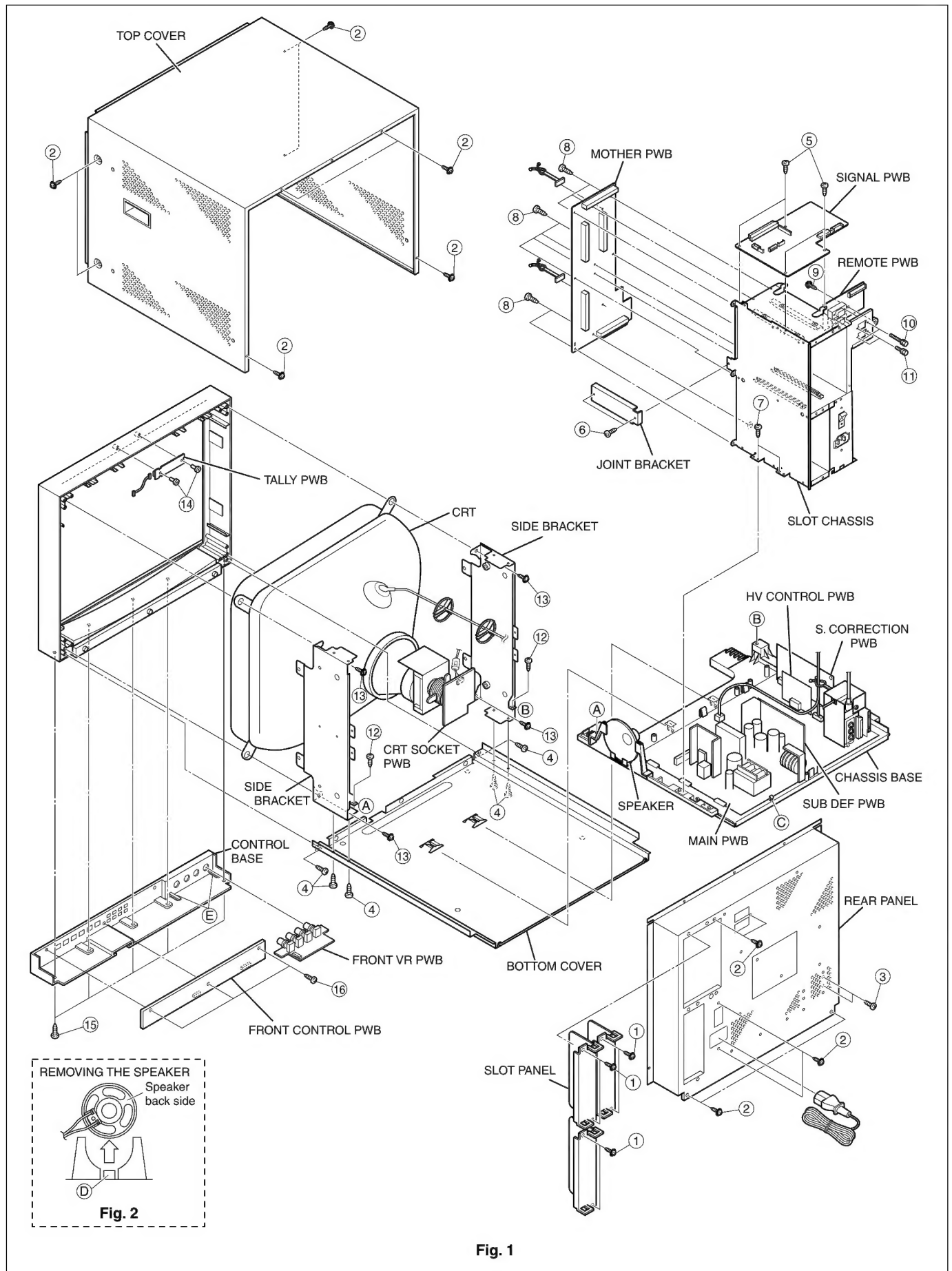
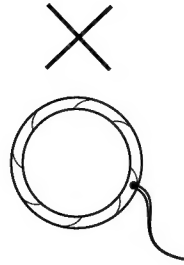
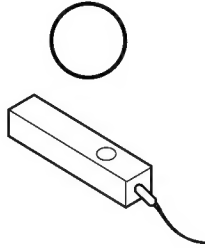


Fig. 1

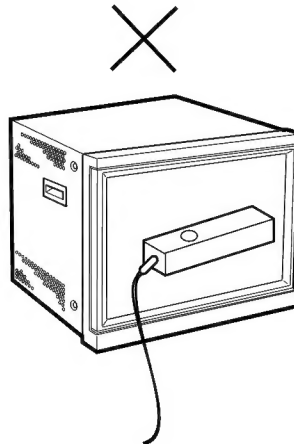
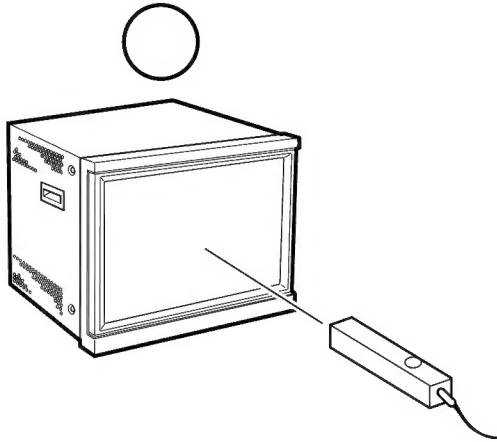
DEMAGNETIZATION PROCEDURE

■ CAUTION

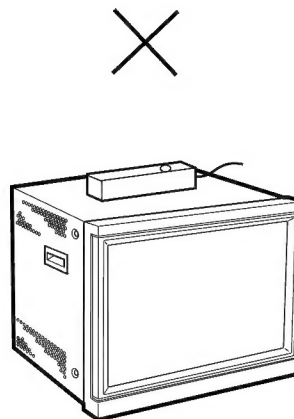
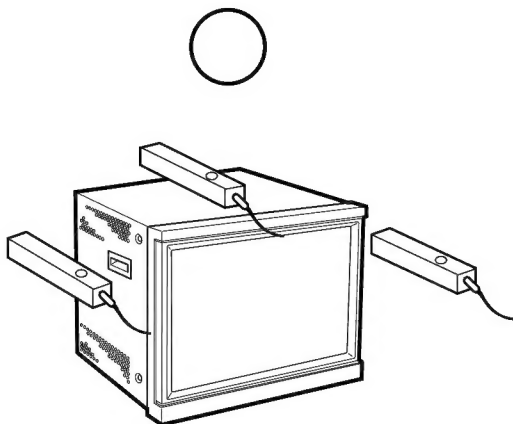
1. Use a rod-type demagnetization coil.
* Never use a ring-shaped demagnetization coil.



2. Keep the demagnetization coil at a distance of more than 1.5 cm from the CRT screen and the main unit during use.
3. When demagnetizing the CRT screen, hold the demagnetization coil perpendicular to the CRT screen.

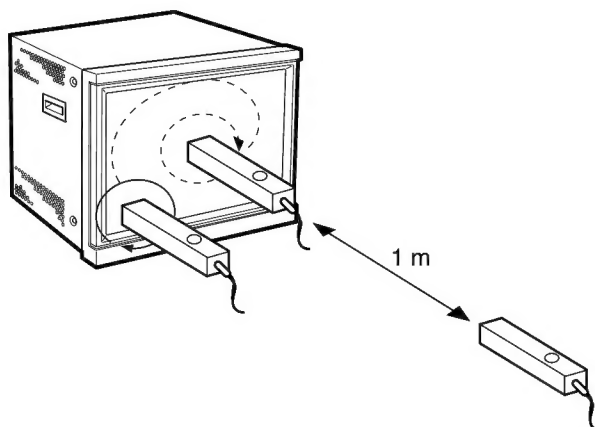


4. When demagnetizing the outer cabinet of the unit, use the demagnetization coil in the orientation as shown below.



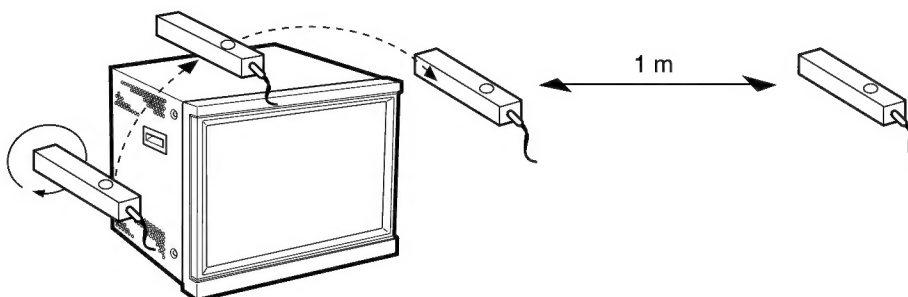
■ DEMAGNETIZING THE CRT SCREEN

1. While holding the power button of the demagnetization coil, move it to approach the CRT screen area that has colour irregularities.
(Keep the demagnetization coil at a distance of more than 1.5 cm from the screen.)
2. From the area with the colour irregularities, move the demagnetization coil as if drawing a spiral toward the centre of the CRT screen.
3. Move the demagnetization coil slowly away from the center of the CRT screen.
4. When the demagnetization coil comes to about 1 meter from the CRT screen, release the demagnetization coil power button.
5. If the colour irregularities are still observed, repeat the above steps once more.



■ DEMAGNETIZING THE OUTER CABINET OF THE UNIT

1. While holding the power button of the demagnetization coil, move it to approach the outer cabinet of the unit.
(Keep the demagnetization coil at a distance of more than 1.5 cm from the cabinet.)
2. Keep the demagnetization coil in the same orientation, and move it around the cabinet as if drawing a circle around the side and top panels of the unit.
3. Move the demagnetization coil slowly away from the outer cabinet of the unit.
4. When the demagnetization coil comes to about 1 meter from the unit, release the power button of the demagnetization coil.



REPLACEMENT OF CHIP COMPONENT

■ CAUTIONS

1. Avoid heating for more than 3 seconds.
2. Do not rub the electrodes and the resist parts of the pattern.
3. When removing a chip part, melt the solder adequately.
4. Do not reuse a chip part after removing it.

■ SOLDERING IRON

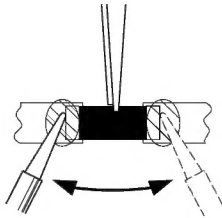
1. Use a high insulation soldering iron with a thin pointed end of it.
2. A 30w soldering iron is recommended for easily removing parts.

■ REPLACEMENT STEPS

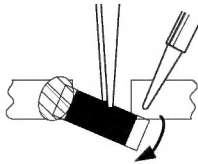
1. How to remove Chip parts

◆ Resistors, capacitors, etc.

- (1) As shown in the figure, push the part with tweezers and alternately melt the solder at each end.

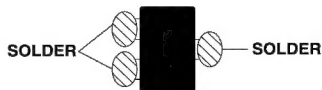


- (2) Shift with tweezers and remove the chip part.

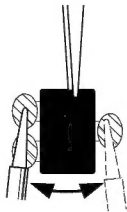


◆ Transistors, diodes, variable resistors, etc.

- (1) Apply extra solder to each lead.



- (2) As shown in the figure, push the part with tweezers and alternately melt the solder at each lead. Shift and remove the chip part.

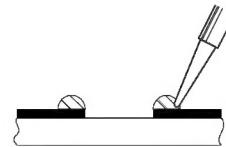


Note : After removing the part, remove remaining solder from the pattern.

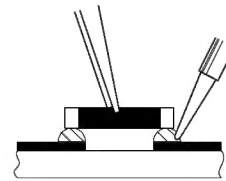
2. How to install Chip parts

◆ Resistors, capacitors, etc.

- (1) Apply solder to the pattern as indicated in the figure.

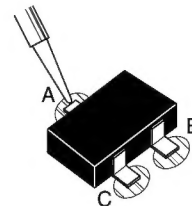


- (2) Grasp the chip part with tweezers and place it on the solder. Then heat and melt the solder at both ends of the chip part.

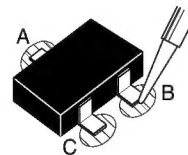


◆ Transistors, diodes, variable resistors, etc.

- (1) Apply solder to the pattern as indicated in the figure.
- (2) Grasp the chip part with tweezers and place it on the solder.
- (3) First solder lead **A** as indicated in the figure.



- (4) Then solder leads **B** and **C**.



REPLACEMENT OF THE MEMORY IC

The unit incorporates a nonvolatile Memory IC, which stores data on the video and deflection systems, etc.

When it is replaced with an IC without the data stored in it, the set may malfunction or the video may become abnormal when the unit is turned on.

When replacing the Memory IC, be sure to use an IC in which the data (initial values) has already been written.

■ REPLACING THE MEMORY IC

1. Turn the unit off and unplug the power cord from the power outlet.
2. Replace the Memory IC with a new Memory IC storing the initial value data.
3. Plug the power cord into the power outlet and turn the unit on.
4. Check the SET-UP MENU and set its items as required.
 - 1) While holding down the  key, press the **VOL -** () key.
 - 2) The SET-UP MENU appears (Fig. 1).
 - 3) Check the items in the SET-UP MENU by comparing them with the data in the table on page 12.

If any item is set differently, set it as required.

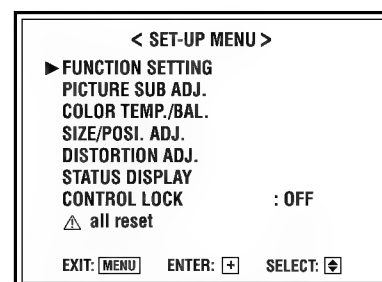


Fig. 1

5. Check the other menus and set their items as required.
Press the **MENU** key to display the MAIN MENU (Fig. 2). Check the items in the MAIN MENU by comparing them with the data in the table on page 13. If any item is set differently, set it as required.

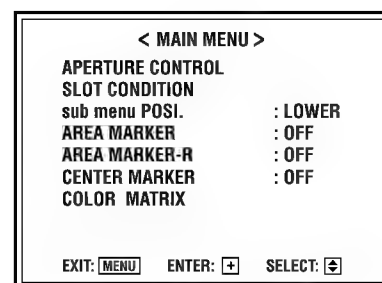


Fig. 2

6. Adjust the items that can be adjusted on the front panel.
(Some items cannot be adjusted unless the required signal is input.)
7. Check that the initial values of the items in the service menu are correct (Fig. 3).
For the setting method, see the corresponding pages for "**SERVICE ADJUSTMENTS**" in this manual.

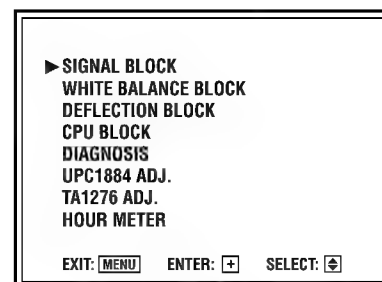


Fig. 3

FACTORY SETTINGS

■ INITIAL VALUES OF THE SET-UP MENU ITEMS

Item	Data/Variable range	Initial setting value	Remarks
FUNCTION SETTING			
COLOR SYSTEM	AUTO/NTSC/PAL	AUTO	Apply the NTSC/PAL color bar signal
RUSH DELAY TIME	STD. /SLOW	STD.	
PICTURE SUB ADJ.			
CONTRAST	-20 — +20	00	
BRIGHT	-20 — +20	00	
CHROMA	-20 — +20	00	
PHASE	-20 — +20	00	
COMPO. LEVEL	SMPTE/B00/B75	SMPTE	Apply the component signal
NTSC SETUP	00 / 7.5	00	
COLOR TEMP. / BAL.			
COLOR TEMP.	LOW / HIGH	LOW	
BLUE DRIVE	MIN — MAX (127 steps)	000	
RED DRIVE	MIN — MAX (127 steps)	000	
GREEN CUTOFF	MIN — MAX (205 steps)	000	
BLUE CUTOFF	MIN — MAX (205 steps)	MIN	
RED CUTOFF	MIN — MAX (205 steps)	000	
SIZE / POSI. ADJ.			
H.SIZE	-20 — +20	00	
H.POSITION	-20 — +20	00	
V.SIZE	-20 — +20	00	
V.POSITION	-20 — +20	00	
DISTORTION ADJ.			
PINCUSHION	-20 — +20	00	
PIN.BALANCE	-20 — +20	00	
PARALLELOGRAM	-20 — +20	00	
TRAPEZOID	-20 — +20	00	
STATUS DISPLAY			
STATUS DISPLAY	ON / OFF	ON	
1080/1035	1035/1080	1080	Apply the component signal
CONTROL LOCK	ON / OFF	OFF	

■ INITIAL VALUES OF MAIN MENU

Item	Data/Variable range	Initial setting value
APERTURE CONTROL		
LEVEL	00 — 10	00
CONTROL FREQ.		HIGH
SLOT CONDITION INPUT A — F	Type of boards installed in the rear panel slots. SLOT1 : INPUT A, B SLOT2 : INPUT C, D SLOT3 : INPUT E, F	
sub menu POSI.	LOWER / UPPER	LOWER
AREA MARKER		OFF
AREA MARKER-R		OFF
CENTER MARKER	ON / OFF	OFF
COLOR MATRIX	SELECT : MANUAL / ITU601 [Example when MANUAL is set] R-Y PHASE : 90/92/94/112 R/B GAIN : 0.56/0.68/0.79/0.86 G-Y PHASE : 236/240/244/253 G/B GAIN : 0.30/0.34/0.40/0.45	MANUAL

■ INITIAL VALUES OF FRONT PANEL CONTROL

Item	Data/Variable range	Initial setting value
POWER	ON/OFF	OFF
INPUT SELECT	INPUT A — F	INPUT A
COLOR OFF AREA MARKER PULSE CROSS ASPECT UNDER SCAN SCREENS CHECK DEGAUSS	ON/OFF	OFF
VOLUME	00 — 50	10
CONTRAST BRIGHT CHROMA PHASE	POTENTIOMETER	Center click position

SERVICING GUIDE

SELF DIAGNOSIS

The unit incorporates a self-diagnosis function and is capable of indicating the absence of raster by blinking on the front panel LEDs and the on-screen display.

1. DISPLAYING THE SELF DIAGNOSIS INDICATIONS

- LED indication: When raster is absent, the six LEDs of INPUT SELECT A to F on the front panel blink to indicate this condition.
- On-screen display: The self diagnosis results can be displayed when the unit is on.

2. LED INDICATION

• Operation during an LED indication:

The main microcomputer detects any abnormalities in communication on the I2C and causes the LEDs to blink.

At the same time, the unit is turned off to protect it but the LEDs keep on blinking.

At this time, the main microcomputer does not accept commands except for the POWER switch on the front panel.

• How to cancel the LED blinking:

Press the POWER switch on the front panel to turn the unit ON again.

• Types of LED indications

LED INDICATION TYPE	ON-SCREEN DISPLAY	DIAGNOSIS RESULT	MALFUNCTIONING CIRCUIT
INPUT A blinking at 0.5-second intervals	I2C-0 DEFLECTION BUS	Communication error in the signal buses (SCL0, SDA0) of I2C	• SIGNAL PWB ASS'Y IC801 • MAIN PWB ASS'Y IC510 • MOTHER PWB ASS'Y IC103 • REMOTE PWB ASS'Y IC102, IC103 • SUB DEF PWB ASS'Y IC001
INPUT B blinking at 0.5-second intervals	I2C-1 SIGNAL BUS	Communication error in the signal buses (SCL1, SDA1) of I2C	• SIGNAL PWB ASS'Y IC102, IC103, IC601, IC801 • FRONT CONTROL PWB ASS'Y IC101
INPUT C blinking at 0.5-second intervals	I2C ROM BUS	Communication error in the ROM buses (SCL2, SDA2) of I2C	• SIGNAL PWB ASS'Y IC801, IC805
INPUT D blinking at 0.5-second intervals	X-RAY	X-rays detected	• SIGNAL PWB ASS'Y IC801 • HV CONTROL PWB ASS'Y IC503
INPUT E blinking at 0.5-second intervals	OCP	Overcurrent detected	• SIGNAL PWB ASS'Y IC801 • MAIN PWB ASS'Y
INPUT F blinking at 0.5-second intervals	VOFF	Neck-break prevention detected	• SIGNAL PWB ASS'Y IC801 • SUB DEF PWB ASS'Y IC005

3. ON-SCREEN DISPLAY (SELF DIAGNOSIS DISPLAY MODE)

- **How to enter the self diagnosis display mode:**

Press a key on the front panel to display the service menu and select "DIAGNOSIS".

(See "Basic Operations of Service Menu" on page 20.)

- **How to clear the trouble history in the self diagnosis mode:**

In the DIAGNOSIS MENU as shown on the left, select "CLEAR".

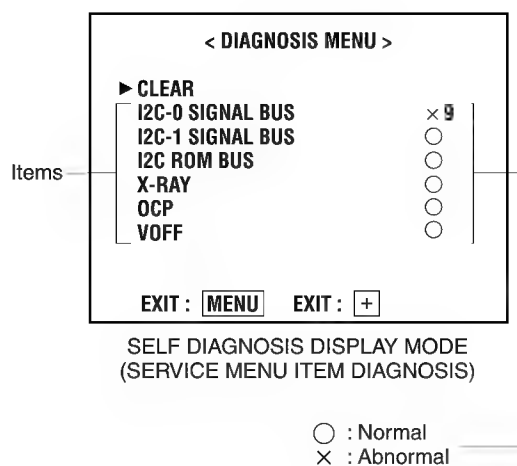
A new screen appears. Press the **VOL +** () on the front panel to select "YES".

This clears the trouble history in the self diagnosis mode and the symbols displayed to the right of all of the items become "○".

- **Trouble history**

The trouble history of each item is counted up to 9. The figure is held in the memory until the trouble history is cleared.

As a result, the displayed trouble history count remains 9 even if it actually exceeds 9.



SERVICE ADJUSTMENTS

BEFORE ADJUSTMENTS

1. Ensure that the 230 V AC power is supplied correctly.
2. Warm run the unit and measuring tools sufficiently (at least 30 minutes).
3. Perform all adjustments based on the initial values. There is no problem if the result of an adjustment performed by observing the screen is different from the initial value.
4. Never attempt to turn on potentiometers or other controls that are not explicitly mentioned in the adjustment procedures.

NOTE: When using the IF-C01PNG (NTSC/PAL Video Input Card) in an adjustment, be sure to check the output waveforms from the video input card in advance.

SETTINGS REQUIRED FOR ADJUSTMENTS

For the functions other than those that should be set before each adjustment, reset them to the initial values according to the table on page 12 before proceeding to the adjustment.
Correct adjustments will not be possible unless the values of the functions are reset to the initial values.

SETTING ITEMS

Begin adjustments with the primary items and then proceed to the secondary items, (1) to (3).

PRIMARY ADJUSTMENT ITEMS

- Screen voltage adjustment and focusing coarse adjustment
- High-voltage coarse adjustment
- X-ray protector adjustment/check
- High-voltage adjustment
- Focus adjustment
- Convergence adjustment
- Front rotation adjustment

SECONDARY ADJUSTMENT ITEMS (1)

- Contrast adjustments
(Overscan, underscan, aspect mode)
- Chroma/Phase adjustments

SECONDARY ADJUSTMENT ITEMS (2)

- Deflection system adjustments
(Overscan, underscan, aspect mode)

SECONDARY ADJUSTMENT ITEMS (3)

- White balance adjustments
- Brightness adjustments
(Overscan, underscan, aspect mode)

MEASURING INSTRUMENTS AND TOOLS

1. DC voltmeter (or digital voltmeter)
2. Oscilloscope
3. Colour analyzer (colour temperature meter)
4. High-voltage voltmeter
5. Signal generator (Should be compatible with the following signal specifications.)
6. Scale (made of non-metallic material)
7. IF-C01PNG (NTSC/PAL Video Input Card)
8. IF-C01COMG (Component/RGB Input Card)

Fromats of Signal Used in Adjustments	Types of Signals Used in Adjustments
● DTV format component signals (480/60i, 480/60p, 576/50i, 720/60p, 1080/24pSF, 1080/60i) ● NTSC signals (Composite, Y/C) ● PAL signals (Composite, Y/C)	● Colour bar signal ● Size adjustment signal ● All white signal ● All black signal ● Mono-scope signal ● Gray scale signal ● 10-step gray scale signal ● Crosshatch signal ● Crosshatch signal with circle pattern

■ FOCUS AND SCREEN ADJUSTMENT HOLES

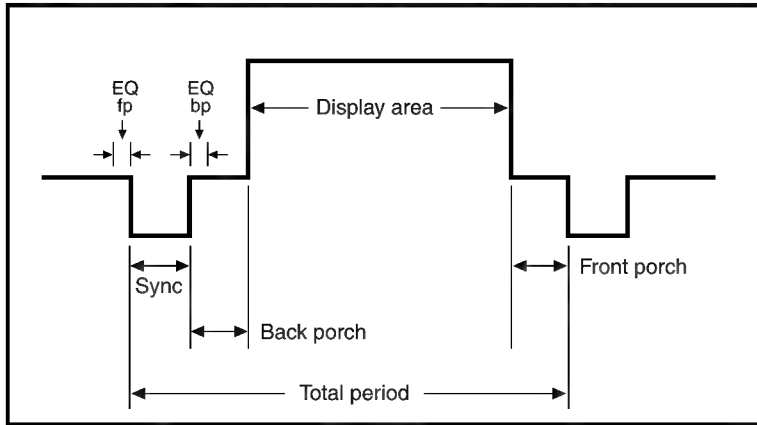
The rear panel has the adjustment holes for use in adjusting the focus and screen.

[CAUTION]

Be sure to use screwdrivers made of non-metallic materials for the following adjustments. If a metallic screwdriver is used, short-circuiting may damage parts of the unit, including the high-voltage parts.

TIMING CHART OF SIGNALS REQUIRED FOR ADJUSTMENTS

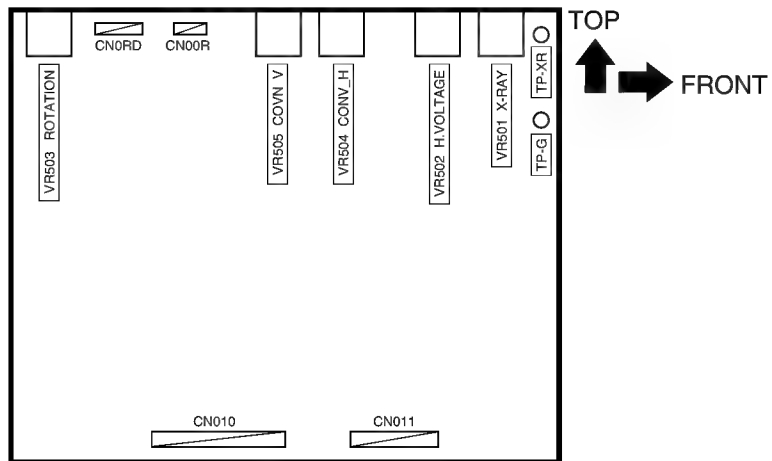
Generate the signals required for adjustments with a programmable signal generator by referring to the following figure.



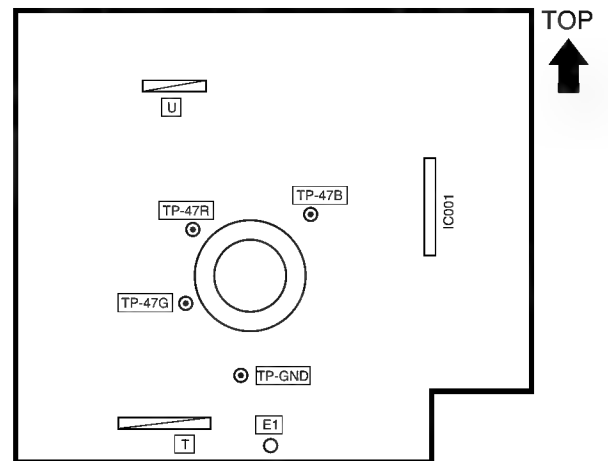
Signal	NTSC (14.3)	PAL	480/60i	576/50i	480/60p	720/60p	1080/24pSF	1080/60i
Resolution (Horizontal)	768	624	720	720	720	1280	1920	1920
Resolution (Vertical)	243	287	244	287	483	720	540	540
Horizontal frequency (kHz)	15.73	15.625	15.73	15.625	31.469	44.955	27	33.75
Vertical frequency (Hz)	29.97i	25i	30i	25i	60p	60p	24pSF (48i)	30i
CS & V		RGB	RGB	RGB	RGB	RGB	RGB	RGB
CS	-1	-1	-1	-1	-1	-1	-1	-1
HS	-1	-1	-1	-1	-1	-1	-1	-1
VS	-1	-1	-1	-1	-1	-1	-1	-1
Dot clock(MHz)	14.318	12	13.5	13.5	27	74.25	74.25	74.25
H period	910	768	858	864	858	1650	2750	2200
H sync	68	56	63	63	63	40	44/44	44/44
H back p.	58	70	59	68	59	260	144/188	144/188
H disp	768	624	720	720	720	1280	1920	1920
V period	263	312	263	312	525	750	562	562
V sync	3	3	3	3	6	5	5	5
V back p.	14	19	13	19	30	20	15	15
V disp	243	287	243	287	483	720	540	540
Equivalent pulse (fp/bp)	3H/3H	3H/3H	3H/3H	3H/3H	0H/0H	0H/0H	0H/0H	0H/0H

ADJUSTMENT LOCATIONS

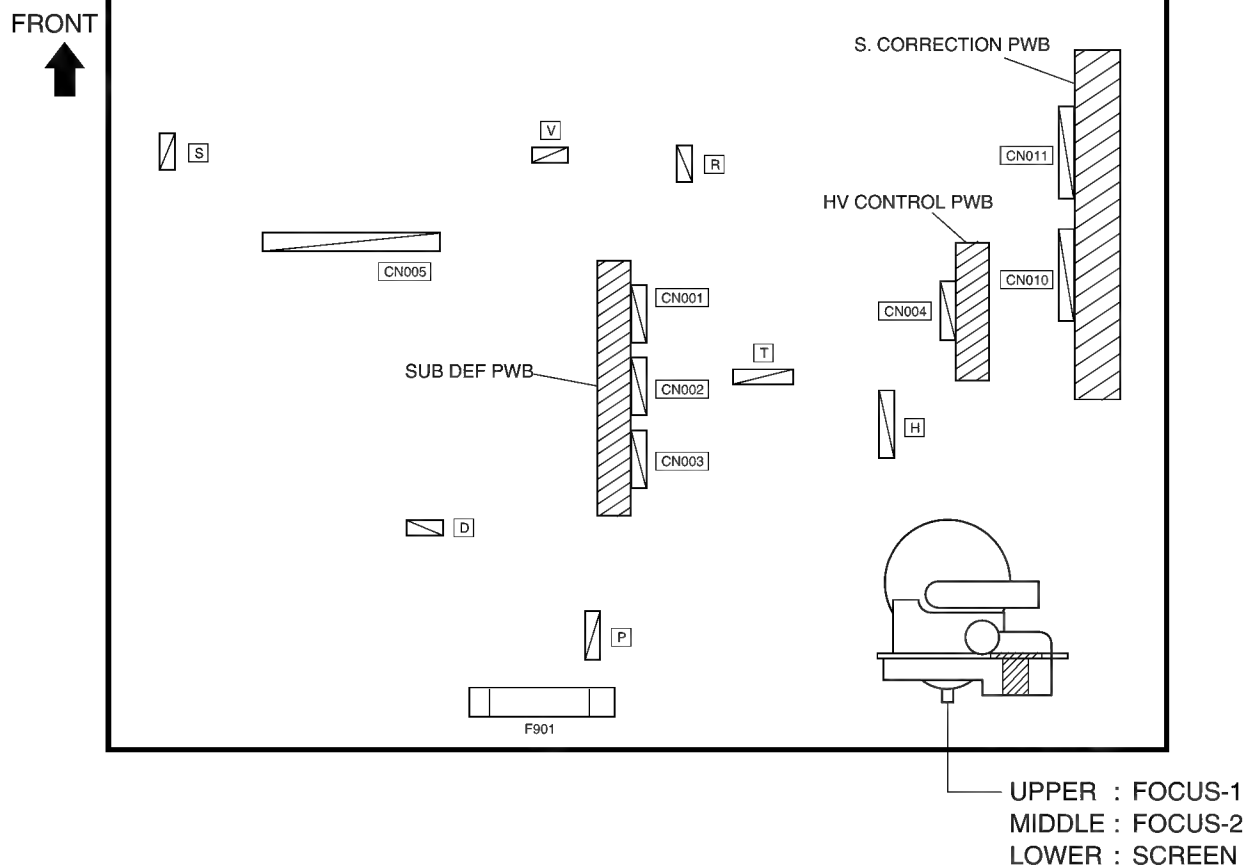
S. CORRECTION PWB (SOLDER SIDE)



CRT SOCKET PWB (SOLDER SIDE)



MAIN PWB



BASIC OPERATIONS OF SERVICE MENU

1. ITEMS IN THE SERVICE MENU

The service menu include the following items. The settings and adjustments are classified into these items.

Do not alter the values of unnecessary items.

SIGNAL BLOCK	: Adjustments of the contrast, brightness, chroma and phase.
WHITE BALANCE BLOCK	: Adjustments of the white balance.
DEFLECTION BLOCK	: Adjustments of the deflection circuitry.
CPU BLOCK	: Setting of the entire system by means of the control values of the microcomputer. (This block is usually not adjusted in servicing. Do not touch it except for adjustment items CC41 and CE05 to CE19.)
DIAGNOSIS	: Display of the results of self diagnosis.
UPC1884 ADJ.	: Display of the status of UPC1884 which is the DEF processor IC. (Do not adjust this item because it is not required for servicing.)
TA1276 ADJ.	: Display of the status of TA1276 which is the RGB processor IC. (Do not adjust this item because it is not required for servicing.)
HOUR METER	: Display of the hour meter count.
UPDATE CPU PROGRAM	: Display of the software version.
INITIALIZE EEPROM	: Initialization of the user-setting menu. (Do not adjust this item because it is not required for servicing.)

2. BASIC OPERATIONS IN THE SERVICE MENU

(1) Entering the Service Menu

Use the front panel keys to display the Service Menu (Fig. 1).

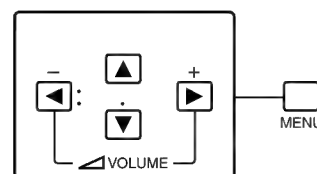


Fig. 1 FRONT PANEL KEYS

- ① While holding the key, press the **MENU** key.

The “△” mark appears at the centre of the screen (Fig. 2).

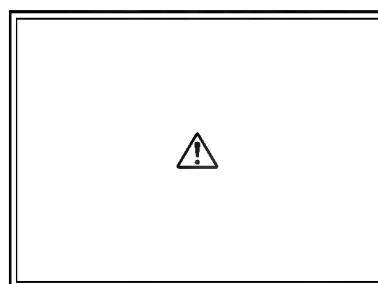


Fig. 2 WRNING MARK

- ② Before the “△” mark disappears (within 5 seconds after it appears), hold the key and press the **VOL-** () key.

Warning message “**Please don't touch!**” appears on the screen (Fig. 3).



Fig. 3 WARNING MESSAGE DISPLAY

- ③ Before the warning message disappears (within 5 seconds after it appears), press the **VOL+** () key.

The service menu items appears on the display (Fig. 4).

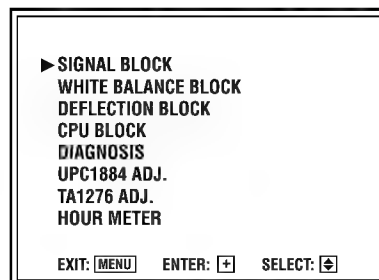
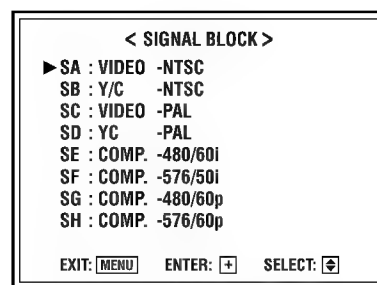


Fig. 4 SERVICE MENU

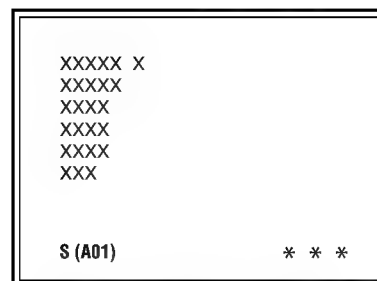
(2) Setting the Service Menu items

- ① With the Service Menu displayed, press the  key to select the item to be adjusted, then press the **VOL+** () key to enter the submenu for the item.



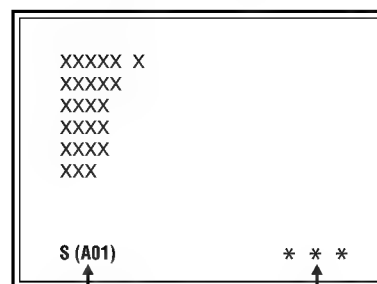
SUBMENU

- ② Press the  key to select the item to be adjusted, then press the **VOL+** () key to enter the item.



ADJUSTMENT ITEM DISPLAY

- ③ Set the adjustment item by varying it with the **VOL-** () and **VOL+** () keys.

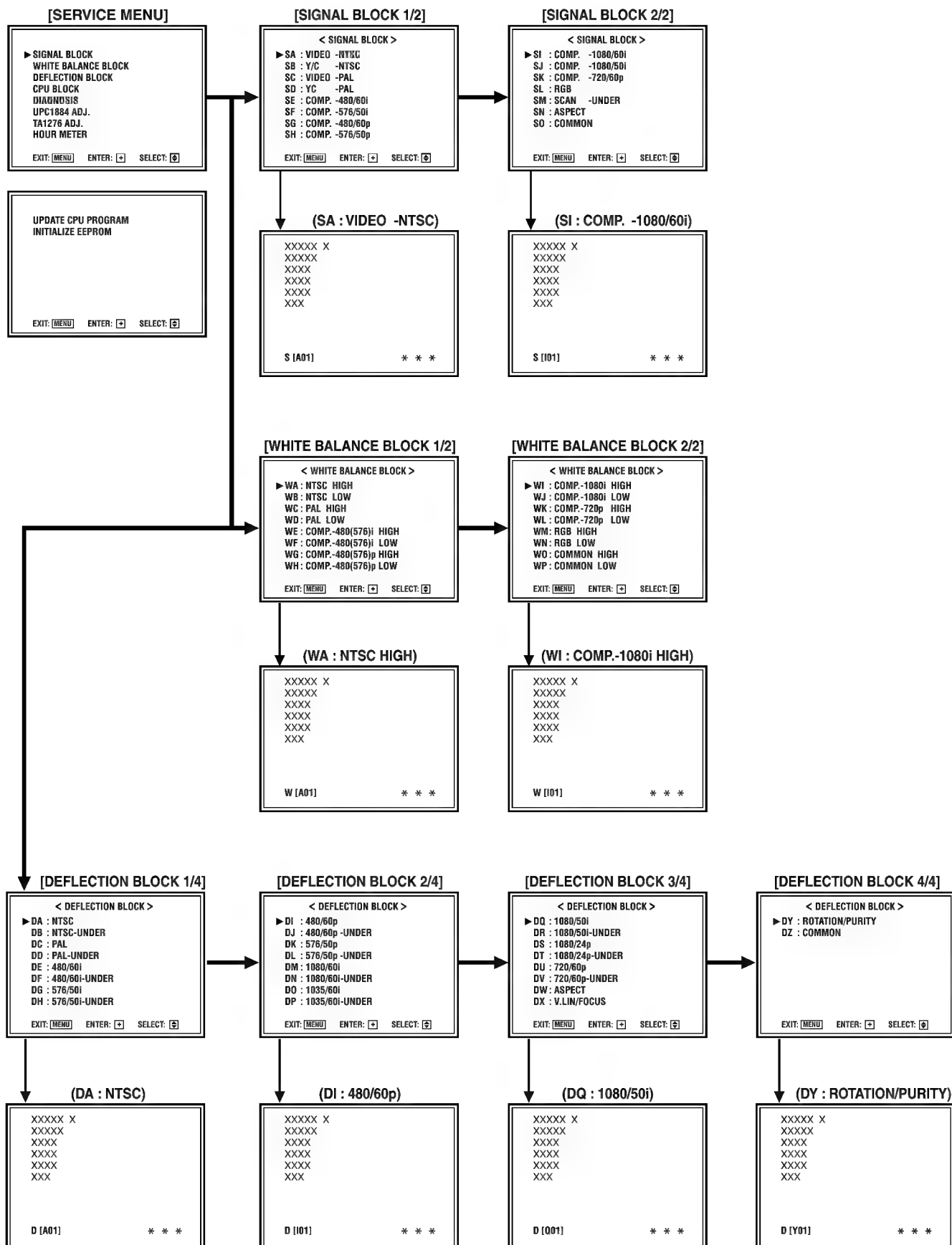


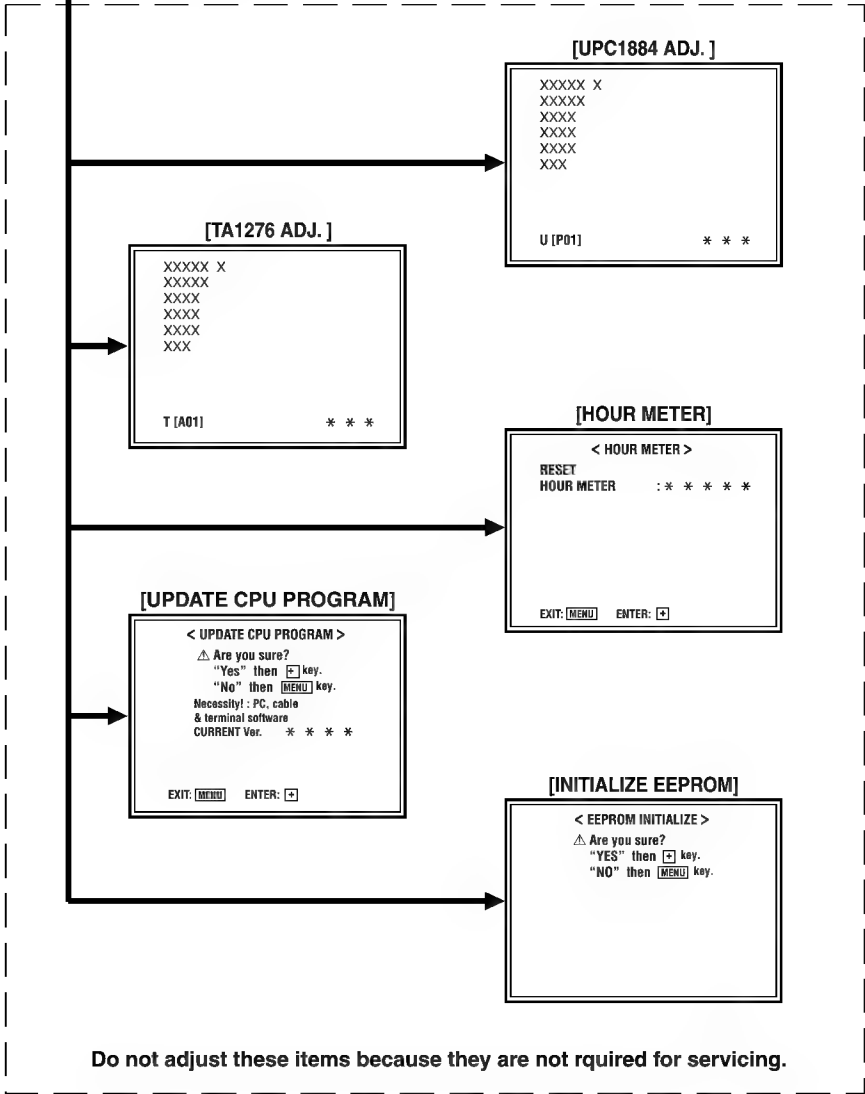
ADJUSTMENT ITEM ADJUSTMENT VALUE

(3) Exiting from the Service Menu

- ① After completing the adjustment of an item, press the **MENU** key to return to the submenu.
- ② Press the **MENU** key again to return to the Service Menu.
- ③ Press the **MENU** key again to return to the normal screen.

SCREEN CONFIGURATION OF THE SERVICE MENU





REFERENCE VALUES FOR THE SERVICE MENU ADJUSTMENTS

Note that the following values other than the fixed values should simply be used as references during adjustments. Their correct values may be variable depending on individual units.

■ SIGNAL BLOCK

Adjustment Item	Function	Variable range	Reference value
SA [VIDEO-NTSC]			
S[A01]	CONTRAST	-064 — +063	+003
S[A02]	BRIGHT HIGH	-128 — +127	000
S[A03]	CHROMA	-064 — +063	+008
S[A04]	PHASE	-064 — +063	+020
S[A05]	APERTURE	-064 — +063	000
S[A06]	BRIGHT LOW	-128 — +127	+001
S[A07]	Y DL	000/001	000 (Fixed value)
S[A08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[A09]	R/B GAIN	000 — 003	002 (Fixed value)
S[A10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[A11]	G/B GAIN	000 — 003	003 (Fixed value)
SB [Y/C-NTSC]			
S[B01]	CONTRAST	-064 — +063	-005
S[B02]	BRIGHT HIGH	-128 — +127	000
S[B03]	CHROMA	-064 — +063	-001
S[B04]	PHASE	-064 — +063	+020
S[B05]	APERTURE	-064 — +063	000
S[B06]	BRIGHT LOW	-128 — +127	+001
S[B07]	Y DL	000/001	000 (Fixed value)
S[B08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[B09]	R/B GAIN	000 — 003	002 (Fixed value)
S[B10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[B11]	G/B GAIN	000 — 003	003 (Fixed value)
SC [VIDEO-PAL]			
S[C01]	CONTRAST	-064 — +063	-007
S[C02]	BRIGHT HIGH	-128 — +127	000
S[C03]	CHROMA	-064 — +063	-002
S[C04]	PHASE	-064 — +063	000
S[C05]	APERTURE	-064 — +063	000
S[C06]	BRIGHT LOW	-128 — +127	-001
S[C07]	Y DL	000/001	000 (Fixed value)
S[C08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[C09]	R/B GAIN	000 — 003	002 (Fixed value)
S[C10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[C11]	G/B GAIN	000 — 003	003 (Fixed value)
SD [YC-PAL]			
S[D01]	CONTRAST	-064 — +063	-005
S[D02]	BRIGHT HIGH	-128 — +127	000
S[D03]	CHROMA	-064 — +063	-005

Adjustment Item	Function	Variable range	Reference value
S[D04]	PHASE	-064 — +063	000
S[D05]	APERTURE	-064 — +063	000
S[D06]	BRIGHT LOW	-128 — +127	-001
S[D07]	Y DL	000/001	000 (Fixed value)
S[D08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[D09]	R/B GAIN	000 — 003	002 (Fixed value)
S[D10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[D11]	G/B GAIN	000 — 003	003 (Fixed value)
SE [COMP.-480/60i]			
S[E01]	CONTRAST	-064 — +063	-002
S[E02]	BRIGHT HIGH	-128 — +127	000
S[E03]	CHROMA	-064 — +063	-002
S[E04]	PHASE	-064 — +063	001
S[E05]	APERTURE	-064 — +063	000
S[E06]	BRIGHT LOW	-128 — +127	000
S[E07]	Y DL	000/001	000 (Fixed value)
S[E08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[E09]	R/B GAIN	000 — 003	002 (Fixed value)
S[E10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[E11]	G/B GAIN	000 — 003	003 (Fixed value)
SF [COMP.-576/50i]			
S[F01]	CONTRAST	-064 — +063	000
S[F02]	BRIGHT HIGH	-128 — +127	000
S[F03]	CHROMA	-064 — +063	000
S[F04]	PHASE	-064 — +063	000
S[F05]	APERTURE	-064 — +063	000
S[F06]	BRIGHT LOW	-128 — +127	000
S[F07]	Y DL	000/001	000 (Fixed value)
S[F08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[F09]	R/B GAIN	000 — 003	002 (Fixed value)
S[F10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[F11]	G/B GAIN	000 — 003	003 (Fixed value)
SG [COMP.-480/60p]			
S[G01]	CONTRAST	-064 — +063	000
S[G02]	BRIGHT HIGH	-128 — +127	000
S[G03]	CHROMA	-064 — +063	000
S[G04]	PHASE	-064 — +063	000
S[G05]	APERTURE	-064 — +063	000
S[G06]	BRIGHT LOW	-128 — +127	000
S[G07]	Y DL	000/001	000 (Fixed value)
S[G08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[G09]	R/B GAIN	000 — 003	002 (Fixed value)
S[G10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[G11]	G/B GAIN	000 — 003	003 (Fixed value)

Adjustment Item	Function	Variable range	Reference value
SH [COMP.-576/50p]			
S[H01]	CONTRAST	-064 — +063	000
S[H02]	BRIGHT HIGH	-128 — +127	000
S[H03]	CHROMA	-064 — +063	000
S[H04]	PHASE	-064 — +063	000
S[H05]	APERTURE	-064 — +063	000
S[H06]	BRIGHT LOW	-128 — +127	000
S[H07]	Y DL	000/001	000 (Fixed value)
S[H08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[H09]	R/B GAIN	000 — 003	002 (Fixed value)
S[H10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[H11]	G/B GAIN	000 — 003	003 (Fixed value)
SI [COMP.-1080/60i]			
S[I01]	CONTRAST	-064 — +063	000
S[I02]	BRIGHT HIGH	-128 — +127	000
S[I03]	CHROMA	-064 — +063	000
S[I04]	PHASE	-064 — +063	000
S[I05]	APERTURE	-064 — +063	000
S[I06]	BRIGHT LOW	-128 — +127	000
S[I07]	Y DL	000/001	000 (Fixed value)
S[I08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[I09]	R/B GAIN	000 — 003	003 (Fixed value)
S[I10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[I11]	G/B GAIN	000 — 003	000 (Fixed value)
SJ [COMP.-1080/50i]			
S[J01]	CONTRAST	-064 — +063	000
S[J02]	BRIGHT HIGH	-128 — +127	000
S[J03]	CHROMA	-064 — +063	000
S[J04]	PHASE	-064 — +063	000
S[J05]	APERTURE	-064 — +063	000
S[J06]	BRIGHT LOW	-128 — +127	000
S[J07]	Y DL	000/001	000 (Fixed value)
S[J08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[J09]	R/B GAIN	000 — 003	003 (Fixed value)
S[J10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[J11]	G/B GAIN	000 — 003	000 (Fixed value)
SK [COMP.-720/60p]			
S[K01]	CONTRAST	-064 — +063	000
S[K02]	BRIGHT HIGH	-128 — +127	000
S[K03]	CHROMA	-064 — +063	000
S[K04]	PHASE	-064 — +063	000
S[K05]	APERTURE	-064 — +063	000
S[K06]	BRIGHT LOW	-128 — +127	000

Adjustment Item	Function	Variable range	Reference value
S[K07]	Y DL	000/001	000 (Fixed value)
S[K08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[K09]	R/B GAIN	000 — 003	003 (Fixed value)
S[K10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[K11]	G/B GAIN	000 — 003	000 (Fixed value)
SL [RGB]			
S[L01]	CONTRAST	-064 — +063	000
S[L02]	BRIGHT HIGH	-128 — +127	-070
S[L03]	BRIGHT LOW	-128 — +127	-070
SM [SCAN-UNDER]			
S[M01]	NTSC-COMPOS. CONTRAST	-064 — +063	000
S[M02]	NTSC-COMPOS. BRIGHT HIGH	-128 — +127	000
S[M03]	NTSC-COMPOS. BRIGHT LOW	-128 — +127	000
S[M04]	NTSC-Y/C CONTRAST	-064 — +063	000
S[M05]	NTSC-Y/C BRIGHT HIGH	-128 — +127	000
S[M06]	NTSC-Y/C BRIGHT LOW	-128 — +127	000
S[M07]	PAL-COMPOS. CONTRAST	-064 — +063	000
S[M08]	PAL-COMPOS. BRIGHT HIGH	-128 — +127	000
S[M09]	PAL-COMPOS. BRIGHT LOW	-128 — +127	000
S[M10]	PAL-Y/C CONTRAST	-064 — +063	000
S[M11]	PAL-Y/C BRIGHT HIGH	-128 — +127	000
S[M12]	PAL-Y/C BRIGHT LOW	-128 — +127	000
S[M13]	480i CONTRAST	-064 — +063	000
S[M14]	480i BRIGHT HIGH	-128 — +127	000
S[M15]	480i BRIGHT LOW	-128 — +127	000
S[M16]	576i CONTRAST	-064 — +063	000
S[M17]	576i BRIGHT HIGH	-128 — +127	000
S[M18]	576i BRIGHT LOW	-128 — +127	000
S[M19]	480p CONTRAST	-064 — +063	000
S[M20]	480p BRIGHT HIGH	-128 — +127	000
S[M21]	480p BRIGHT LOW	-128 — +127	000
S[M22]	576p CONTRAST	-064 — +063	000
S[M23]	576p BRIGHT HIGH	-128 — +127	000
S[M24]	576p BRIGHT LOW	-128 — +127	000
S[M25]	1080/60i,1035/60i CONTRAST	-064 — +063	000
S[M26]	1080/60i,1035/60i BRIGHT HIGH	-128 — +127	000
S[M27]	1080/60i,1035/60i BRIGHT LOW	-128 — +127	000
S[M28]	1080/50i,1080/24p CONTRAST	-064 — +063	000
S[M29]	1080/50i,1080/24p BRIGHT HIGH	-128 — +127	000
S[M30]	1080/50i,1080/24p BRIGHT LOW	-128 — +127	000
S[M31]	720p CONTRAST	-064 — +063	000
S[M32]	720p BRIGHT HIGH	-128 — +127	000
S[M33]	720p BRIGHT LOW	-128 — +127	000

Adjustment Item	Function	Variable range	Reference value
SN [ASPECT]			
S[N01]	NTSC-COMPOS. OVERSCAN CONTRAST	-064 — +063	000
S[N02]	NTSC-COMPOS. OVERSCAN BRIGHT HIGH	-128 — +127	000
S[N03]	NTSC-COMPOS. OVERSCAN BRIGHT LOW	-128 — +127	000
S[N04]	NTSC-COMPOS. UNDERSCAN CONTRAST	-064 — +063	000
S[N05]	NTSC-COMPOS. UNDERSCAN BRIGHT HIGH	-128 — +127	000
S[N06]	NTSC-COMPOS. UNDERSCAN BRIGHT LOW	-128 — +127	000
S[N07]	NTSC-Y/C OVERSCAN CONTRAST	-064 — +063	000
S[N08]	NTSC-Y/C OVERSCAN BRIGHT HIGH	-128 — +127	000
S[N09]	NTSC-Y/C OVERSCAN BRIGHT LOW	-128 — +127	000
S[N10]	NTSC-Y/C UNDERSCAN CONTRAST	-064 — +063	000
S[N11]	NTSC-Y/C UNDERSCAN BRIGHT HIGH	-128 — +127	000
S[N12]	NTSC-Y/C UNDERSCAN BRIGHT LOW	-128 — +127	000
S[N13]	PAL-COMPOS. OVERSCAN CONTRAST	-064 — +063	000
S[N14]	PAL-COMPOS. OVERSCAN BRIGHT HIGH	-128 — +127	000
S[N15]	PAL-COMPOS. OVERSCAN BRIGHT LOW	-128 — +127	000
S[N16]	PAL-COMPOS. UNDERSCAN CONTRAST	-064 — +063	000
S[N17]	PAL-COMPOS. UNDERSCAN BRIGHT HIGH	-128 — +127	000
S[N18]	PAL-COMPOS. UNDERSCAN BRIGHT LOW	-128 — +127	000
S[N19]	PAL-Y/C OVERSCAN CONTRAST	-064 — +063	000
S[N20]	PAL-Y/C OVERSCAN BRIGHT HIGH	-128 — +127	000
S[N21]	PAL-Y/C OVERSCAN BRIGHT LOW	-128 — +127	000
S[N22]	PAL-Y/C UNDERSCAN CONTRAST	-064 — +063	000
S[N23]	PAL-Y/C UNDERSCAN BRIGHT HIGH	-128 — +127	000
S[N24]	PAL-Y/C UNDERSCAN BRIGHT LOW	-128 — +127	000
S[N25]	480i OVERSCAN CONTRAST	-064 — +063	000
S[N26]	480i OVERSCAN BRIGHT HIGH	-128 — +127	000
S[N27]	480i OVERSCAN BRIGHT LOW	-128 — +127	000
S[N28]	480i UNDERSCAN CONTRAST	-064 — +063	000
S[N29]	480i UNDERSCAN BRIGHT HIGH	-128 — +127	000
S[N30]	480i UNDERSCAN BRIGHT LOW	-128 — +127	000
S[N31]	576i OVERSCAN CONTRAST	-064 — +063	000
S[N32]	576i OVERSCAN BRIGHT HIGH	-128 — +127	000
S[N33]	576i OVERSCAN BRIGHT LOW	-128 — +127	000
S[N34]	576i UNDERSCAN CONTRAST	-064 — +063	000
S[N35]	576i UNDERSCAN BRIGHT HIGH	-128 — +127	000
S[N36]	576i UNDERSCAN BRIGHT LOW	-128 — +127	000
S[N37]	480p OVERSCAN CONTRAST	-064 — +063	000
S[N38]	480p OVERSCAN BRIGHT HIGH	-128 — +127	000
S[N39]	480p OVERSCAN BRIGHT LOW	-128 — +127	000
S[N40]	480p UNDERSCAN CONTRAST	-064 — +063	000
S[N41]	480p UNDERSCAN BRIGHT HIGH	-128 — +127	000
S[N42]	480p UNDERSCAN BRIGHT LOW	-128 — +127	000

Adjustment Item	Function	Variable range	Reference value
S[N43]	576p OVERSCAN CONTRAST	-064 — +063	000
S[N44]	576p OVERSCAN BRIGHT HIGH	-128 — +127	000
S[N45]	576p OVERSCAN BRIGHT LOW	-128 — +127	000
S[N46]	576p UNDERSCAN CONTRAST	-064 — +063	000
S[N47]	576p UNDERSCAN BRIGHT HIGH	-128 — +127	000
S[N48]	576p UNDERSCAN BRIGHT LOW	-128 — +127	000
SO [COMMON] * When the value of item SO is changed, items SA to SN should be re-adjusted.			
S[O01]	CONTRAST	000 — 127	085
S[O02]	BRIGHT HIGH	000 — 255	128
S[O03]	CHROMA	000 — 127	064
S[O04]	PHASE	000 — 127	064
S[O05]	APERTURE	000 — 127	035
S[O06]	BRIGHT LOW	-128 — +127	000
S[O07]	Y DL	000/001	000 (Fixed value)
S[O08]	R-Y PHASE	000 — 003	000 (Fixed value)
S[O09]	R/B GAIN	000 — 003	003 (Fixed value)
S[O10]	G-Y PHASE	000 — 003	002 (Fixed value)
S[O11]	G/B GAIN	000 — 003	000 (Fixed value)

■ WHITE BALANCE BLOCK

Adjustment Item	Function	Variable range	Reference value
WA [NTSC(COMPOS.,Y/C) HIGH]			
W[A01]	DRIVE (R)	-128 — +127	000
W[A02]	DRIVE (G)	-128 — +127	000
W[A03]	DRIVE (B)	-128 — +127	000
W[A04]	CUTOFF (R)	-128 — +127	000
W[A05]	CUTOFF (G)	-128 — +127	000
W[A06]	CUTOFF (B)	-128 — +127	000
WB [NTSC(COMPOS.,Y/C) LOW]			
W[B01]	DRIVE (R)	-128 — +127	000
W[B02]	DRIVE (G)	-128 — +127	000
W[B03]	DRIVE (B)	-128 — +127	000
W[B04]	CUTOFF (R)	-128 — +127	000
W[B05]	CUTOFF (G)	-128 — +127	000
W[B06]	CUTOFF (B)	-128 — +127	000
WC [PAL(COMPOS.,Y/C) HIGH]			
W[C01]	DRIVE (R)	-128 — +127	000
W[C02]	DRIVE (G)	-128 — +127	000
W[C03]	DRIVE (B)	-128 — +127	000
W[C04]	CUTOFF (R)	-128 — +127	000
W[C05]	CUTOFF (G)	-128 — +127	000
W[C06]	CUTOFF (B)	-128 — +127	000
WD [PAL(COMPOS.,Y/C) LOW]			
W[D01]	DRIVE (R)	-128 — +127	000
W[D02]	DRIVE (G)	-128 — +127	000
W[D03]	DRIVE (B)	-128 — +127	000
W[D04]	CUTOFF (R)	-128 — +127	000
W[D05]	CUTOFF (G)	-128 — +127	000
W[D06]	CUTOFF (B)	-128 — +127	000
WE [COMP.-480(576)i HIGH]			
W[E01]	DRIVE (R)	-128 — +127	000
W[E02]	DRIVE (G)	-128 — +127	000
W[E03]	DRIVE (B)	-128 — +127	000
W[E04]	CUTOFF (R)	-128 — +127	000
W[E05]	CUTOFF (G)	-128 — +127	000
W[E06]	CUTOFF (B)	-128 — +127	000
WF [COMP.-480(576)i LOW]			
W[F01]	DRIVE (R)	-128 — +127	000
W[F02]	DRIVE (G)	-128 — +127	000
W[F03]	DRIVE (B)	-128 — +127	000
W[F04]	CUTOFF (R)	-128 — +127	000
W[F05]	CUTOFF (G)	-128 — +127	000
W[F06]	CUTOFF (B)	-128 — +127	000

Adjustment Item	Function	Variable range	Reference value
WG [COMP.-480(576)p HIGH]			
W[G01]	DRIVE (R)	-128 — +127	000
W[G02]	DRIVE (G)	-128 — +127	000
W[G03]	DRIVE (B)	-128 — +127	000
W[G04]	CUTOFF (R)	-128 — +127	000
W[G05]	CUTOFF (G)	-128 — +127	000
W[G06]	CUTOFF (B)	-128 — +127	000
WH [COMP.-480(576)p LOW]			
W[H01]	DRIVE (R)	-128 — +127	000
W[H02]	DRIVE (G)	-128 — +127	000
W[H03]	DRIVE (B)	-128 — +127	000
W[H04]	CUTOFF (R)	-128 — +127	000
W[H05]	CUTOFF (G)	-128 — +127	000
W[H06]	CUTOFF (B)	-128 — +127	000
WI [COMP.-1080i(1035/60i,1080/60i) HIGH]			
W[I01]	DRIVE (R)	-128 — +127	000
W[I02]	DRIVE (G)	-128 — +127	000
W[I03]	DRIVE (B)	-128 — +127	000
W[I04]	CUTOFF (R)	-128 — +127	000
W[I05]	CUTOFF (G)	-128 — +127	000
W[I06]	CUTOFF (B)	-128 — +127	000
WJ [COMP.-1080i(1035/60i,1080/60i) LOW]			
W[J01]	DRIVE (R)	-128 — +127	000
W[J02]	DRIVE (G)	-128 — +127	000
W[J03]	DRIVE (B)	-128 — +127	000
W[J04]	CUTOFF (R)	-128 — +127	000
W[J05]	CUTOFF (G)	-128 — +127	000
W[J06]	CUTOFF (B)	-128 — +127	000
WK [COMP.-720p HIGH]			
W[K01]	DRIVE (R)	-128 — +127	000
W[K02]	DRIVE (G)	-128 — +127	000
W[K03]	DRIVE (B)	-128 — +127	000
W[K04]	CUTOFF (R)	-128 — +127	000
W[K05]	CUTOFF (G)	-128 — +127	000
W[K06]	CUTOFF (B)	-128 — +127	000
WL [COMP.-720p LOW]			
W[L01]	DRIVE (R)	-128 — +127	000
W[L02]	DRIVE (G)	-128 — +127	000
W[L03]	DRIVE (B)	-128 — +127	000
W[L04]	CUTOFF (R)	-128 — +127	000
W[L05]	CUTOFF (G)	-128 — +127	000
W[L06]	CUTOFF (B)	-128 — +127	000

Adjustment Item	Function	Variable range	Reference value
WM [RGB HIGH]			
W[M01]	DRIVE (R)	-128 — +127	000
W[M02]	DRIVE (G)	-128 — +127	000
W[M03]	DRIVE (B)	-128 — +127	000
W[M04]	CUTOFF (R)	-128 — +127	000
W[M05]	CUTOFF (G)	-128 — +127	000
W[M06]	CUTOFF (B)	-128 — +127	000
WN [RGB LOW]			
W[N01]	DRIVE (R)	-128 — +127	000
W[N02]	DRIVE (G)	-128 — +127	000
W[N03]	DRIVE (B)	-128 — +127	000
W[N04]	CUTOFF (R)	-128 — +127	000
W[N05]	CUTOFF (G)	-128 — +127	000
W[N06]	CUTOFF (B)	-128 — +127	000
WO [COMMON HIGH] * When the value of item WO is changed, items WA, WC, WE, WG, WI, WK and WM should be re-adjusted.			
W[O01]	DRIVE (R)	000 — 127	070
W[O02]	DRIVE (G)	000 — 127	064
W[O03]	DRIVE (B)	000 — 127	055
W[O04]	CUTOFF (R)	000 — 255	050
W[O05]	CUTOFF (G)	000 — 255	050
W[O06]	CUTOFF (B)	000 — 255	050
WP [COMMON LOW] * When the value of item WP is changed, items WB, WD, WF, WH, WJ, WL and WN should be re-adjusted.			
W[P01]	DRIVE (R)	000 — 127	075
W[P02]	DRIVE (G)	000 — 127	064
W[P03]	DRIVE (B)	000 — 127	040
W[P04]	CUTOFF (R)	000 — 255	050
W[P05]	CUTOFF (G)	000 — 255	050
W[P06]	CUTOFF (B)	000 — 255	050

■ DEFLECTION BLOCK

Adjustment Item	Function	Variable range	Reference value
DA [NTSC(COMPOS.,Y/C)]			
D[A01]	HORIZONTAL SIZE	-064 — +064	-023
D[A02]	VERTICAL SIZE	-064 — +064	+048
D[A03]	HORIZONTAL POSITION	-064 — +064	+012
D[A04]	VERTICAL POSITION	-064 — +064	+005
D[A05]	SIDE PIN DISTORTION	-032 — +032	+009
D[A06]	CORNER DISTORTION (W)	-032 — +032	-003
D[A07]	CORNER DISTORTION (S)	-032 — +032	000
D[A08]	PARALLELOGRAM DISTORTION	-032 — +032	+002
D[A09]	TRAPEZOIDAL DISTORTION	-032 — +032	+006
D[A10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[A11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[A12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	+001
DB [NTSC(COMPOS.,Y/C)-UNDER]			
D[B01]	HORIZONTAL SIZE	-064 — +064	-010
D[B02]	VERTICAL SIZE	-064 — +064	-025
D[B03]	HORIZONTAL POSITION	-064 — +064	000
D[B04]	VERTICAL POSITION	-064 — +064	000
D[B05]	SIDE PIN DISTORTION	-032 — +032	000
D[B06]	CORNER DISTORTION (W)	-032 — +032	000
D[B07]	CORNER DISTORTION (S)	-032 — +032	000
D[B08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[B09]	TRAPEZOIDAL DISTORTION	-032 — +032	000
D[B10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[B11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[B12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DC [PAL(COMPOS.,Y/C)]			
D[C01]	HORIZONTAL SIZE	-064 — +064	-022
D[C02]	VERTICAL SIZE	-064 — +064	+048
D[C03]	HORIZONTAL POSITION	-064 — +064	+008
D[C04]	VERTICAL POSITION	-064 — +064	+012
D[C05]	SIDE PIN DISTORTION	-032 — +032	+009
D[C06]	CORNER DISTORTION (W)	-032 — +032	-002
D[C07]	CORNER DISTORTION (S)	-032 — +032	-001
D[C08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[C09]	TRAPEZOIDAL DISTORTION	-032 — +032	+008
D[C10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[C11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	-004
D[C12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	+005
DD [PAL(COMPOS.,Y/C)-UNDER]			
D[D01]	HORIZONTAL SIZE	-064 — +064	-010
D[D02]	VERTICAL SIZE	-064 — +064	-025

Adjustment Item	Function	Variable range	Reference value
D[D03]	HORIZONTAL POSITION	-064 — +064	000
D[D04]	VERTICAL POSITION	-064 — +064	000
D[D05]	SIDE PIN DISTORTION	-032 — +032	000
D[D06]	CORNER DISTORTION (W)	-032 — +032	000
D[D07]	CORNER DISTORTION (S)	-032 — +032	000
D[D08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[D09]	TRAPEZOIDAL DISTORTION	-032 — +032	000
D[D10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[D11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[D12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DE [480/60i]			
D[E01]	HORIZONTAL SIZE	-064 — +064	-025
D[E02]	VERTICAL SIZE	-064 — +064	+050
D[E03]	HORIZONTAL POSITION	-064 — +064	+012
D[E04]	VERTICAL POSITION	-064 — +064	000
D[E05]	SIDE PIN DISTORTION	-032 — +032	+009
D[E06]	CORNER DISTORTION (W)	-032 — +032	-001
D[E07]	CORNER DISTORTION (S)	-032 — +032	-003
D[E08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[E09]	TRAPEZOIDAL DISTORTION	-032 — +032	+005
D[E10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[E11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	+001
D[E12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	+001
DF [480/60i-UNDER]			
D[F01]	HORIZONTAL SIZE	-064 — +064	-011
D[F02]	VERTICAL SIZE	-064 — +064	-030
D[F03]	HORIZONTAL POSITION	-064 — +064	000
D[F04]	VERTICAL POSITION	-064 — +064	000
D[F05]	SIDE PIN DISTORTION	-032 — +032	000
D[F06]	CORNER DISTORTION (W)	-032 — +032	000
D[F07]	CORNER DISTORTION (S)	-032 — +032	000
D[F08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[F09]	TRAPEZOIDAL DISTORTION	-032 — +032	000
D[F10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[F11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[F12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DG [576/50i]			
D[G01]	HORIZONTAL SIZE	-064 — +064	-025
D[G02]	VERTICAL SIZE	-064 — +064	+050
D[G03]	HORIZONTAL POSITION	-064 — +064	+005
D[G04]	VERTICAL POSITION	-064 — +064	+005
D[G05]	SIDE PIN DISTORTION	-032 — +032	+009

Adjustment Item	Function	Variable range	Reference value
D[G06]	CORNER DISTORTION (W)	-032 — +032	-002
D[G07]	CORNER DISTORTION (S)	-032 — +032	-002
D[G08]	PARALLELOGRAM DISTORTION	-032 — +032	+002
D[G09]	TRAPEZOIDAL DISTORTION	-032 — +032	+010
D[G10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[G11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	-003
D[G12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	+003
DH [576/50i-UNDER]			
D[H01]	HORIZONTAL SIZE	-064 — +064	-011
D[H02]	VERTICAL SIZE	-064 — +064	-030
D[H03]	HORIZONTAL POSITION	-064 — +064	000
D[H04]	VERTICAL POSITION	-064 — +064	000
D[H05]	SIDE PIN DISTORTION	-032 — +032	000
D[H06]	CORNER DISTORTION (W)	-032 — +032	000
D[H07]	CORNER DISTORTION (S)	-032 — +032	000
D[H08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[H09]	TRAPEZOIDAL DISTORTION	-032 — +032	000
D[H10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[H11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[H12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DI [480/60p]			
D[I01]	HORIZONTAL SIZE	-064 — +064	-022
D[I02]	VERTICAL SIZE	-064 — +064	+050
D[I03]	HORIZONTAL POSITION	-064 — +064	+007
D[I04]	VERTICAL POSITION	-064 — +064	+002
D[I05]	SIDE PIN DISTORTION	-032 — +032	+002
D[I06]	CORNER DISTORTION (W)	-032 — +032	-002
D[I07]	CORNER DISTORTION (S)	-032 — +032	-002
D[I08]	PARALLELOGRAM DISTORTION	-032 — +032	+001
D[I09]	TRAPEZOIDAL DISTORTION	-032 — +032	+010
D[I10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[I11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	-003
D[I12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	+003
DJ [480/60p-UNDER]			
D[J01]	HORIZONTAL SIZE	-064 — +064	-010
D[J02]	VERTICAL SIZE	-064 — +064	-025
D[J03]	HORIZONTAL POSITION	-064 — +064	000
D[J04]	VERTICAL POSITION	-064 — +064	-002
D[J05]	SIDE PIN DISTORTION	-032 — +032	000
D[J06]	CORNER DISTORTION (W)	-032 — +032	000
D[J07]	CORNER DISTORTION (S)	-032 — +032	000
D[J08]	PARALLELOGRAM DISTORTION	-032 — +032	000

Adjustment Item	Function	Variable range	Reference value
D[J09]	TRAPEZOIDAL DISTORTION	-032 — +032	-003
D[J10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[J11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[J12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DK [576/50p]			
D[K01]	HORIZONTAL SIZE	-064 — +064	-023
D[K02]	VERTICAL SIZE	-064 — +064	+050
D[K03]	HORIZONTAL POSITION	-064 — +064	+003
D[K04]	VERTICAL POSITION	-064 — +064	+005
D[K05]	SIDE PIN DISTORTION	-032 — +032	+002
D[K06]	CORNER DISTORTION (W)	-032 — +032	000
D[K07]	CORNER DISTORTION (S)	-032 — +032	-005
D[K08]	PARALLELOGRAM DISTORTION	-032 — +032	+001
D[K09]	TRAPEZOIDAL DISTORTION	-032 — +032	+017
D[K10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[K11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	-002
D[K12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	+003
DL [576/50p-UNDER]			
D[L01]	HORIZONTAL SIZE	-064 — +064	-010
D[L02]	VERTICAL SIZE	-064 — +064	-025
D[L03]	HORIZONTAL POSITION	-064 — +064	000
D[L04]	VERTICAL POSITION	-064 — +064	-002
D[L05]	SIDE PIN DISTORTION	-032 — +032	000
D[L06]	CORNER DISTORTION (W)	-032 — +032	000
D[L07]	CORNER DISTORTION (S)	-032 — +032	000
D[L08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[L09]	TRAPEZOIDAL DISTORTION	-032 — +032	-003
D[L10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[L11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[L12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DM [1080/60i]			
D[M01]	HORIZONTAL SIZE	-064 — +064	-020
D[M02]	VERTICAL SIZE	-064 — +064	+030
D[M03]	HORIZONTAL POSITION	-064 — +064	+023
D[M04]	VERTICAL POSITION	-064 — +064	-010
D[M05]	SIDE PIN DISTORTION	-032 — +032	+012
D[M06]	CORNER DISTORTION (W)	-032 — +032	-002
D[M07]	CORNER DISTORTION (S)	-032 — +032	-002
D[M08]	PARALLELOGRAM DISTORTION	-032 — +032	+002
D[M09]	TRAPEZOIDAL DISTORTION	-032 — +032	+002
D[M10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[M11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[M12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000

Adjustment Item	Function	Variable range	Reference value
DN [1080/60i-UNDER]			
D[N01]	HORIZONTAL SIZE	-064 — +064	-010
D[N02]	VERTICAL SIZE	-064 — +064	-030
D[N03]	HORIZONTAL POSITION	-064 — +064	000
D[N04]	VERTICAL POSITION	-064 — +064	-002
D[N05]	SIDE PIN DISTORTION	-032 — +032	000
D[N06]	CORNER DISTORTION (W)	-032 — +032	000
D[N07]	CORNER DISTORTION (S)	-032 — +032	000
D[N08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[N09]	TRAPEZOIDAL DISTORTION	-032 — +032	000
D[N10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[N11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[N12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DO [1035/60i]			
D[O01]	HORIZONTAL SIZE	-064 — +064	-020
D[O02]	VERTICAL SIZE	-064 — +064	+045
D[O03]	HORIZONTAL POSITION	-064 — +064	+022
D[O04]	VERTICAL POSITION	-064 — +064	+005
D[O05]	SIDE PIN DISTORTION	-032 — +032	+012
D[O06]	CORNER DISTORTION (W)	-032 — +032	000
D[O07]	CORNER DISTORTION (S)	-032 — +032	-002
D[O08]	PARALLELOGRAM DISTORTION	-032 — +032	+002
D[O09]	TRAPEZOIDAL DISTORTION	-032 — +032	+009
D[O10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[O11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[O12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	+003
DP [1035/60i-UNDER]			
D[P01]	HORIZONTAL SIZE	-064 — +064	-013
D[P02]	VERTICAL SIZE	-064 — +064	-030
D[P03]	HORIZONTAL POSITION	-064 — +064	000
D[P04]	VERTICAL POSITION	-064 — +064	-002
D[P05]	SIDE PIN DISTORTION	-032 — +032	000
D[P06]	CORNER DISTORTION (W)	-032 — +032	000
D[P07]	CORNER DISTORTION (S)	-032 — +032	000
D[P08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[P09]	TRAPEZOIDAL DISTORTION	-032 — +032	000
D[P10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[P11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[P12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DQ [1080/50i]			
D[Q01]	HORIZONTAL SIZE	-064 — +064	-020
D[Q02]	VERTICAL SIZE	-064 — +064	+033
D[Q03]	HORIZONTAL POSITION	-064 — +064	+033

Adjustment Item	Function	Variable range	Reference value
D[Q04]	VERTICAL POSITION	-064 — +064	-008
D[Q05]	SIDE PIN DISTORTION	-032 — +032	+014
D[Q06]	CORNER DISTORTION (W)	-032 — +032	000
D[Q07]	CORNER DISTORTION (S)	-032 — +032	-004
D[Q08]	PARALLELOGRAM DISTORTION	-032 — +032	+002
D[Q09]	TRAPEZOIDAL DISTORTION	-032 — +032	+003
D[Q10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[Q11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[Q12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DR [1080/50i-UNDER]			
D[R01]	HORIZONTAL SIZE	-064 — +064	-012
D[R02]	VERTICAL SIZE	-064 — +064	-030
D[R03]	HORIZONTAL POSITION	-064 — +064	000
D[R04]	VERTICAL POSITION	-064 — +064	-002
D[R05]	SIDE PIN DISTORTION	-032 — +032	000
D[R06]	CORNER DISTORTION (W)	-032 — +032	000
D[R07]	CORNER DISTORTION (S)	-032 — +032	000
D[R08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[R09]	TRAPEZOIDAL DISTORTION	-032 — +032	000
D[R10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[R11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[R12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DS [1080/24p]			
D[S01]	HORIZONTAL SIZE	-064 — +064	-020
D[S02]	VERTICAL SIZE	-064 — +064	+033
D[S03]	HORIZONTAL POSITION	-064 — +064	+033
D[S04]	VERTICAL POSITION	-064 — +064	-008
D[S05]	SIDE PIN DISTORTION	-032 — +032	+015
D[S06]	CORNER DISTORTION (W)	-032 — +032	-001
D[S07]	CORNER DISTORTION (S)	-032 — +032	-002
D[S08]	PARALLELOGRAM DISTORTION	-032 — +032	+001
D[S09]	TRAPEZOIDAL DISTORTION	-032 — +032	+003
D[S10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[S11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[S12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DT [1080/24p-UNDER]			
D[T01]	HORIZONTAL SIZE	-064 — +064	-012
D[T02]	VERTICAL SIZE	-064 — +064	-030
D[T03]	HORIZONTAL POSITION	-064 — +064	000
D[T04]	VERTICAL POSITION	-064 — +064	-002
D[T05]	SIDE PIN DISTORTION	-032 — +032	000
D[T06]	CORNER DISTORTION (W)	-032 — +032	000

Adjustment Item	Function	Variable range	Reference value
D[T07]	CORNER DISTORTION (S)	-032 — +032	000
D[T08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[T09]	TRAPEZOIDAL DISTORTION	-032 — +032	000
D[T10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[T11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[T12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DU [720/60p]			
D[U01]	HORIZONTAL SIZE	-064 — +064	+030
D[U02]	VERTICAL SIZE	-064 — +064	+035
D[U03]	HORIZONTAL POSITION	-064 — +064	+012
D[U04]	VERTICAL POSITION	-064 — +064	-012
D[U05]	SIDE PIN DISTORTION	-032 — +032	+009
D[U06]	CORNER DISTORTION (W)	-032 — +032	000
D[U07]	CORNER DISTORTION (S)	-032 — +032	-003
D[U08]	PARALLELOGRAM DISTORTION	-032 — +032	+002
D[U09]	TRAPEZOIDAL DISTORTION	-032 — +032	+002
D[U10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[U11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[U12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DV [720/60p-UNDER]			
D[V01]	HORIZONTAL SIZE	-064 — +064	-019
D[V02]	VERTICAL SIZE	-064 — +064	-030
D[V03]	HORIZONTAL POSITION	-064 — +064	000
D[V04]	VERTICAL POSITION	-064 — +064	-002
D[V05]	SIDE PIN DISTORTION	-032 — +032	000
D[V06]	CORNER DISTORTION (W)	-032 — +032	000
D[V07]	CORNER DISTORTION (S)	-032 — +032	000
D[V08]	PARALLELOGRAM DISTORTION	-032 — +032	000
D[V09]	TRAPEZOIDAL DISTORTION	-032 — +032	000
D[V10]	HORIZONTAL ARC DISTORTION	-032 — +032	000
D[V11]	VERTICAL LINEARITY (S CORRECTION)	-016 — +016	000
D[V12]	VERTICAL LINEARITY (C CORRECTION)	-016 — +016	000
DW [ASPECT]			
D[W01]	NTSC OVERSCAN VERTICAL SIDE	-064 — +064	-008
D[W02]	NTSC OVERSCAN VERTICAL POSITION	-064 — +064	-002
D[W03]	NTSC OVERSCAN SIDE PIN DISTORTION	-032 — +032	+008
D[W04]	NTSC UNDERSCAN VERTICAL SIZE	-064 — +064	-008
D[W05]	NTSC UNDERSCAN VERTICAL POSITION	-064 — +064	-002
D[W06]	NTSC UNDERSCAN SIDE PIN DISTORTION	-032 — +032	+008
D[W07]	PAL OVERSCAN VERTICAL SIDE	-064 — +064	-004
D[W08]	PAL OVERSCAN VERTICAL POSITION	-064 — +064	-002
D[W09]	PAL OVERSCAN SIDE PIN DISTORTION	-032 — +032	+008

Adjustment Item	Function	Variable range	Reference value
D[W10]	PAL UNDERSCAN VERTICAL SIZE	-064 — +064	-008
D[W11]	PAL UNDERSCAN VERTICAL POSITION	-064 — +064	-004
D[W12]	PAL UNDERSCAN SIDE PIN DISTORTION	-032 — +032	+008
D[W13]	480i OVERSCAN VERTICAL SIZE	-064 — +064	-010
D[W14]	480i OVERSCAN VERTICAL POSITION	-064 — +064	-002
D[W15]	480i OVERSCAN SIDE PIN DISTORTION	-032 — +032	+008
D[W16]	480i UNDERSCAN VERTICAL SIZE	-064 — +064	-008
D[W17]	480i UNDERSCAN VERTICAL POSITION	-064 — +064	-002
D[W18]	480i UNDERSCAN SIDE PIN DISTORTION	-032 — +032	+008
D[W19]	576i OVERSCAN VERTICAL SIZE	-064 — +064	-010
D[W20]	576i OVERSCAN VERTICAL POSITION	-064 — +064	-002
D[W21]	576i OVERSCAN SIDE PIN DISTORTION	-032 — +032	+008
D[W22]	576i UNDERSCAN VERTICAL SIZE	-064 — +064	-008
D[W23]	576i UNDERSCAN VERTICAL POSITION	-064 — +064	-002
D[W24]	576i UNDERSCAN SIDE PIN DISTORTION	-032 — +032	+008
D[W25]	480p OVERSCAN VERTICAL SIZE	-064 — +064	-003
D[W26]	480p OVERSCAN VERTICAL POSITION	-064 — +064	-003
D[W27]	480p OVERSCAN SIDE PIN DISTORTION	-032 — +032	+011
D[W28]	480p UNDERSCAN VERTICAL SIZE	-064 — +064	-010
D[W29]	480p UNDERSCAN VERTICAL POSITION	-064 — +064	-003
D[W30]	480p UNDERSCAN SIDE PIN DISTORTION	-032 — +032	+011
D[W31]	576p OVERSCAN VERTICAL SIZE	-064 — +064	-003
D[W32]	576p OVERSCAN VERTICAL POSITION	-064 — +064	000
D[W33]	576p OVERSCAN SIDE PIN DISTORTION	-032 — +032	+011
D[W34]	576p UNDERSCAN VERTICAL SIZE	-064 — +064	-007
D[W35]	576p UNDERSCAN VERTICAL POSITION	-064 — +064	000
D[W36]	576p UNDERSCAN SIDE PIN DISTORTION	-032 — +032	+012
DX [V.LIN/FOCUS]			
D[X01]	45 — 55Hz VERTICAL LINEARITY (S CORRECTION)	-016 — +016	+011
D[X02]	45 — 55Hz VERTICAL LINEARITY (C CORRECTION)	-016 — +016	+003
D[X03]	45 — 55Hz FOCUS (PARABOLA)	-032 — +032	000
D[X04]	55 — 65Hz VERTICAL LINEARITY (S CORRECTION)	-016 — +016	+011
D[X05]	55 — 65Hz VERTICAL LINEARITY (C CORRECTION)	-016 — +016	+003
D[X06]	55 — 65Hz FOCUS (PARABOLA)	-032 — +032	000
D[X07]	SPARE (S CORRECTION)	-016 — +016	000
D[X08]	SPARE (C CORRECTION)	-016 — +016	000
D[X09]	SPARE (PARABOLA)	-032 — +032	000
DY [ROTATION/PURITY]			
D[Y01]	ROTATION	-032 — +031	+015
D[Y02]	PURITY	-128 — +127	000

Adjustment Item	Function	Variable range	Reference value
DZ [COMMON]			
D[Z01]	HORIZONTAL SIZE	000 — 127	063
D[Z02]	VERTICAL SIZE	000 — 127	063
D[Z03]	HORIZONTAL POSITION	000 — 127	063
D[Z04]	VERTICAL POSITION	000 — 127	080
D[Z05]	SIDE PIN DISTORTION	000 — 063	031
D[Z06]	CORNER DISTORTION (W)	000 — 063	031
D[Z07]	CORNER DISTORTION (S)	000 — 063	031
D[Z08]	PARALLELOGRAM DISTORTION	000 — 063	031
D[Z09]	TRAPEZOIDAL DISTORTION	000 — 063	031
D[Z10]	HORIZONTAL ARC DISTORTION	000 — 063	031
D[Z11]	VERTICAL LINEARITY (S CORRECTION)	000 — 031	016
D[Z12]	VERTICAL LINEARITY (C CORRECTION)	000 — 031	016
D[Z13]	VERTICAL MAX SIZE CONTROL	000 — 031	016
D[Z14]	FOCUS (PHASE)	000 — 063	022
D[Z15]	FOCUS (PARABOLA)	000 — 063	044

■ CPU BLOCK

Adjustment Item	Function	Variable range	Reference value
CC [SETTING]			
C[C41]	AKB SETTING	000 — 003	000
CE [OSD etc]			
C[E05]	NTSC, 480/60i CORNER DISTORTION (W)	-032 — +032	000
C[E06]	NTSC, 480/60i CORNER DISTORTION (S)	-032 — +032	+002
C[E07]	NTSC, 480/60i PARALLELOGRAM DISTORTION	-032 — +032	000
C[E08]	NTSC, 480/60i TRAPEZOIDAL DISTORTION	-032 — +032	-002
C[E09]	NTSC, 480/60i HORIZONTAL ARC DISTORTION	-032 — +032	000
C[E010]	PAL, 576/50i CORNER DISTORTION (W)	-032 — +032	+003
C[E011]	PAL, 576/50i CORNER DISTORTION (S)	-032 — +032	000
C[E012]	PAL, 576/50i PARALLELOGRAM DISTORTION	-032 — +032	000
C[E013]	PAL, 576/50i TRAPEZOIDAL DISTORTION	-032 — +032	-004
C[E014]	PAL, 576/50i HORIZONTAL ARC DISTORTION	-032 — +032	000
C[E015]	480/60p CORNER DISTORTION (W)	-032 — +032	000
C[E016]	480/60p CORNER DISTORTION (S)	-032 — +032	+002
C[E017]	480/60p PARALLELOGRAM DISTORTION	-032 — +032	000
C[E018]	480/60p TRAPEZOIDAL DISTORTION	-032 — +032	-005
C[E019]	480/60p HORIZONTAL ARC DISTORTION	-032 — +032	000

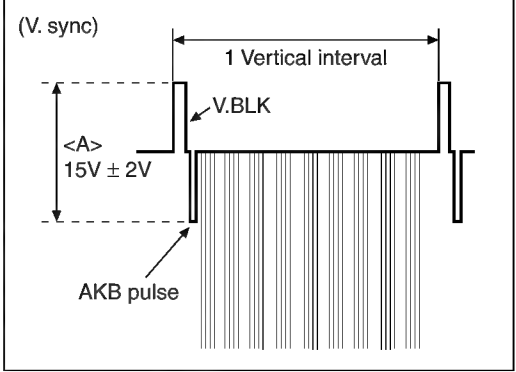
ADJUSTMENT PROCEDURES

SCREEN VOLTAGE ADJUSTMENT AND FOCUS COARSE ADJUSTMENT

SCREEN VOLTAGE ADJUSTMENT AND FOCUS COARSE ADJUSTMENT	
Measuring Instruments	Signal generator (All-black signal, Crosshatch signal) Oscilloscope
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	TP-47B, TP-47R, TP-47G [CRT SOCKET PWB] TP-GND [CRT SOCKET PWB]
Adjustment Points	SCREEN VR [Bottom potentiometer on high-voltage transformer] FOCUS VR1 [Top potentiometer on high-voltage transformer] FOCUS VR2 [Middle potentiometer on high-voltage transformer] CC41 (AKB Setting) [Service Menu]

Note: Ensure that the value of CC41 (CPU BLOCK) in the Service Menu is "000".

- Turn the **SCREEN VR** fully counterclockwise.
- Connect the oscilloscope across TP-47B and TP-GND and turn the unit ON.
- Apply the 1080/60i component all-black signal to INPUT A.
- Turn the **SCREEN VR** slowly clockwise until the raster lights up slightly.
- Set the value of **CC41 (CPU BLOCK)** in the Service Menu from "000" to "003".
- Turn the **SCREEN VR** slowly clockwise until the voltage amplitude <A> of the AKB pulse at TP-47B is about **15 V**.
- Observe the waveforms at TP-47R and TP-47G to ensure that the V.BLK pulse is present.
If V.BLK is not clear, adjust the **SCREEN VR** so that the voltage amplitude <A> of the AKB pulse at TP-47R and TP-47G becomes **15 ± 2 V**.
- Apply the 1080/60i crosshatch signal to INPUT A.
- Adjust the **FOCUS VR1** and **VR2** so that the entire image is in focus.

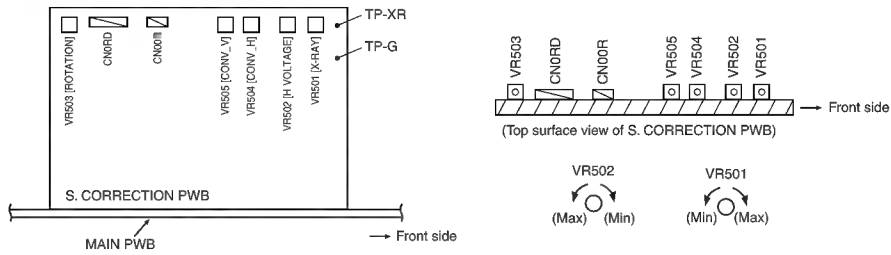


HIGH-VOLTAGE COARSE ADJUSTMENT

HIGH-VOLTAGE COARSE ADJUSTMENT	
Measuring Instruments	Signal generator (Crosshatch signal) High-voltage voltmeter
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	Anode of CRT
Adjustment Points	VR502 (High-Voltage VR) [S. CORRECTION PWB] FOCUS VR1 [Top potentiometer on high-voltage transformer] FOCUS VR2 [Middle potentiometer on high-voltage transformer]

Note: Perform the following adjustments after completing the Screen Voltage and Focus Coarse adjustments.

- Turn **VR502** fully clockwise (the minimum position).
- Turn **VR501** fully counterclockwise (the minimum position).
- Connect the high-voltage voltmeter to the anode of the CRT and turn the unit ON.
- Apply the 1080/60i crosshatch signal to INPUT A (Terminal Y on the Component/RGB Input Card).
- Turn **VR502** slowly counterclockwise until the value of the high voltage is about **25 kV**.
- Adjust the **FOCUS VR1** and **VR2** so that the entire image is in focus.

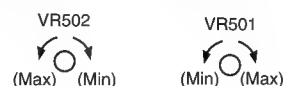
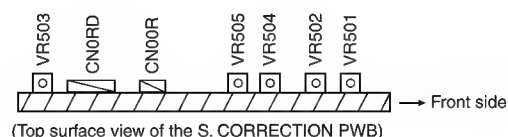
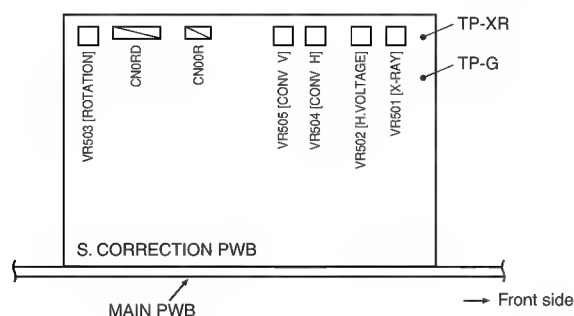


X-RAY PROTECTOR ADJUSTMENT/CHECK

X-RAY PROTECTOR ADJUSTMENT/CHECK	
Measuring Instruments	Signal generator (All-white signal) High-voltage voltmeter DC voltmeter
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	Anode of CRT TP-XR, TP-GND [S. CORRECTION PWB]
Adjustment Points	VR501 (X-Ray Protector Adjustment VR) [S. CORRECTION PWB] VR502 (High-Voltage VR) [S. CORRECTION PWB]

Note: Perform the following adjustment after completing the Screen Voltage adjustment.

1. Turn the **VR502** fully clockwise (the minimum position).
2. Turn the **VR501** fully counterclockwise (the minimum position).
3. Set the CONTRAST and BRIGHT potentiometers on the front panel to the fully clockwise positions.
4. Connect the high-voltage voltmeter to the anode of the CRT and turn the unit ON.
5. Apply the 1080/60i all-white signal to INPUT A (Terminal Y on the Component/RGB Input Card).
6. Turn the **VR502** slowly counterclockwise until the value of the high-voltage voltmeter is **27.0 kV $\pm$ 0.2 kV**.
7. Connect the DC voltmeter across TP-XR and TP-GND.
8. Turn the **VR501** clockwise until the voltmeter reading is **5.5 V**.
9. Turn the **VR501** slowly clockwise until the point at which the X-ray protector starts operation.
(The INPUT SELECT D LED on the front panel should blink.)
10. Turn the **VR502** slightly clockwise and turn the unit ON again.
11. Turn the **VR502** slowly counterclockwise and check the point at which the X-ray protector starts to operate.
Check that the high-voltage voltmeter value at which the X-ray protector starts to operate, is **27.0 kV $\pm$ 0.2 kV**.
12. Apply adhesive for fixing the **VR501** in the adjusted position.
13. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.



HIGH-VOLTAGE ADJUSTMENT

HIGH-VOLTAGE ADJUSTMENT	
Measuring Instruments	Signal generator (All-black signal) High-voltage voltmeter
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	Anode of CRT
Adjustment Points	VR502 (High-Voltage VR) [S. CORRECTION PWB]

Note: Perform the following adjustments after completing the Screen Voltage and X-Ray Protector adjustments.

1. Turn the **VR502** fully clockwise.
2. Connect the high-voltage voltmeter to the anode of the CRT and turn the unit ON.
3. Apply the 1080/60i all-black signal to INPUT A (Terminal Y on the Component/RGB Input Card).
4. If the raster is visible, adjust the BRIGHT potentiometer on the front panel to turn the screen all black.
5. Turn **VR502** slowly counterclockwise until the value of the high voltage is **25 kV ± 0.2 kV**.
6. Apply adhesive for fixing the **VR502** in the adjusted position.
7. Set the BRIGHT potentiometer on the front panel to the centre click position.

FOCUS ADJUSTMENT

FOCUS ADJUSTMENT	
Measuring Instruments	Signal generator (Character signal)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	FOCUS VR1 [Top potentiometer on high-voltage transformer] FOCUS VR2 [Middle potentiometer on high-voltage transformer]

Note: Perform the following adjustments after completing the Screen Voltage, X-Ray Protector and High-Voltage adjustments.

1. Apply the 1080/60i character signal to INPUT A (Terminal Y on the Component/RGB Input Card).
2. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
3. Adjust the **FOCUS VR1** and **VR2** so that the characters in the image are clearly visible.

CONVERGENCE ADJUSTMENT

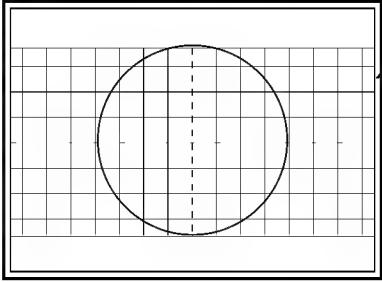
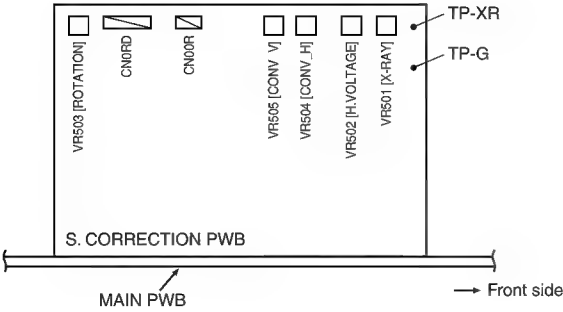
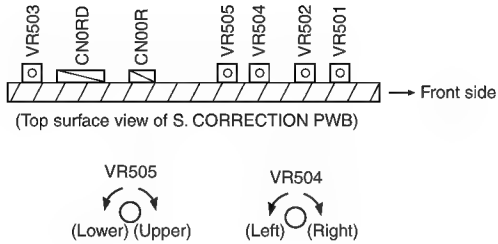
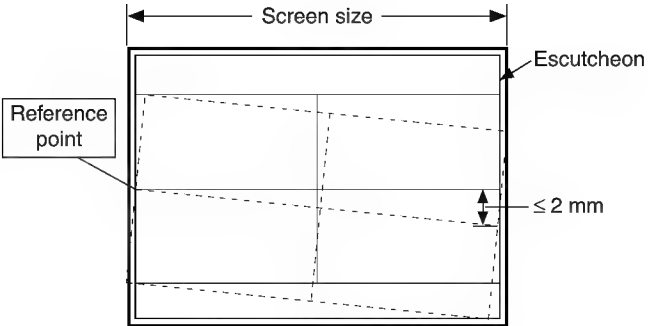
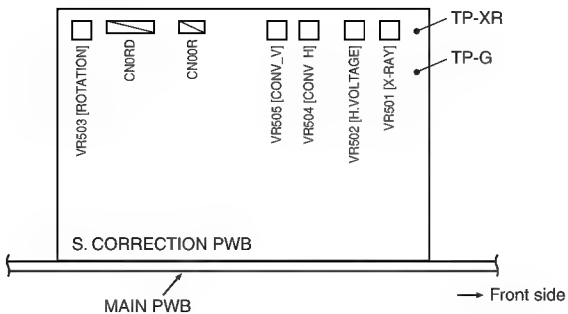
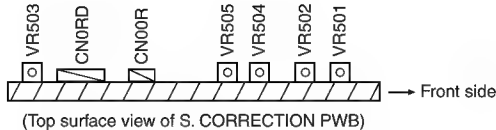
CONVERGENCE ADJUSTMENT	
Measuring Instruments	Signal generator (Crosshatch signal with circle pattern)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	VR504 (CONV_H) [S. CORRECTION PWB] VR505 (CONV_V) [S. CORRECTION PWB]
Notes: • Perform the following adjustments after completing the Screen Voltage, X-Ray Protector, High Voltage and Focus adjustments. • Ensure that CN0RD and CN00R on the S. Correction PWB are connected to the Deflection yoke and Main Board. 1. Apply the 1080/60i crosshatch signal with circle pattern to INPUT A (Terminal Y on the Component/RGB Input Card). 2. Turn the VR504 to optimize the horizontal convergence value at the centre of the screen (turning the potentiometer counterclockwise shifts BLUE toward the right with respect to RED). 3. Turn the VR505 to optimize the vertical convergence value at the centre of the screen (turning the potentiometer counterclockwise shifts BLUE downward with respect to RED).	
	
	
	

IMAGE ROTATION ADJUSTMENT

IMAGE ROTATION ADJUSTMENT	
Measuring Instruments	Signal generator (Size adjustment signal)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	DY01 (Rotation), DM04 (Vertical Position) [Service Menu] VR503 (ROTATION) [S. CORRECTION PWB]
Notes: • Perform the following adjustments after completing the Screen Voltage, High-Voltage, Focus and X-Ray Protector adjustments. • Ensure that CN0RD and CN00R on the S. Correction PWB are connected to the Deflection Yoke and Main PWB. • If the S. Correction PWB has VR503 on it, adjust the image tilting by turning VR503 instead of using the remote control cord (DY01). 1. Apply the 1080/60i size adjustment signal to INPUT A (Terminal Y on the Component/RGB Input Card). 2. Adjust DY01 of the Service Menu to decrease the image tilting to no more than 2 mm. If the reference point which is the vertical centre position on the left of the image (reference points) is deviated, adjust DM04 to correct it.	
 Diagram illustrating the image rotation adjustment. The screen size is indicated. The reference point is marked on the left edge. The deviation is indicated as $\leq 2 \text{ mm}$.	
 Diagram showing the S. CORRECTION PWB and its connection to the MAIN PWB. The S. CORRECTION PWB is connected to the MAIN PWB via TP-XR and TP-G. The components VR503, CN0RD, CN00R, VR505, VR504, VR502, and VR501 are shown.	
 Diagram showing the top surface view of the S. CORRECTION PWB. The components VR503, CN0RD, CN00R, VR505, VR504, VR502, and VR501 are shown. The front side is indicated.	

CONTRAST ADJUSTMENTS

CONTRAST ADJUSTMENT (HDTV)

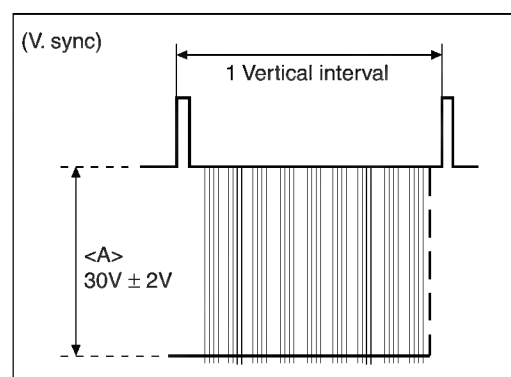
Measuring Instruments	Signal generator (Crosshatch signal) Oscilloscope
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	TP-47G [CRT SOCKET PWB] TP-GND [CRT SOCKET PWB]
Adjustment Points	S*01 (Overscan Contrast), SM** (Underscan Contrast) [Service Menu]

Notes:

- Perform the following adjustments after completing the Screen Voltage adjustment.
- Set the CONTRAST data in the Setup Menu to "00".
- The value adjusted at the SO adjustment becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (HDTV, SDTV and NTSC/PAL). When re-adjusting the 1080/60i signal, use the SI.
- When overscan data of a signal is changed, it is required to re-adjust the underscan data of the same adjustment signal.

— Standard value (SO) adjustment —

1. Apply the 1080/60i crosshatch signal to INPUT A (Terminal Y on the Component/RGB Input Card).
2. Set the CONTRAST potentiometer on the front panel to the centre click position.
3. Connect the oscilloscope across TP-47G and TP-GND.
4. Adjust **SO01** in the Service Menu to set the voltage amplitude <A> in the figure on the right to **30 V ± 2 V**.



— Other signals adjustments —

5. Apply the 1080/60i crosshatch signal to INPUT A (Terminal Y on the Component/RGB Input Card).
6. Set the CONTRAST potentiometer on the front panel to the centre click position.
7. Connect the oscilloscope across TP-47G and TP-GND.
8. Adjust **SI01** in the Service Menu to set the voltage amplitude <A> in the figure on the right to **30 V ± 2 V**.
9. Set the UNDER SCAN button on the front panel to ON so that the scanning size is set to underscanning.
10. Adjust **SM25** to set the voltage amplitude <A> to **30 V ± 2 V**.
11. Press the UNDER SCAN button on the front panel to set the underscan to OFF.
12. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 5 to 11 above (see Table 1).

Adjustment Signal	Scanning Size	Adjustment Data
COMMON	Overscan	SO01
	Underscan	—
1080/60i	Overscan	SI01
	Underscan	SM25
1080/24pSF	Overscan	SJ01
	Underscan	SM28
720/60p	Overscan	SK01
	Underscan	SM31

Table 1

CONTRAST ADJUSTMENT (SDTV)

Measuring Instruments	Signal generator (Crosshatch signal) Oscilloscope
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	TP-47G [CRT SOCKET PWB] TP-GND [CRT SOCKET PWB]
Adjustment Points	S*01 (4:3 Overscan Contrast), SM** (4:3 Underscan Contrast), SN** (16:9 Overscan/Underscan Contrast) [Service Menu]

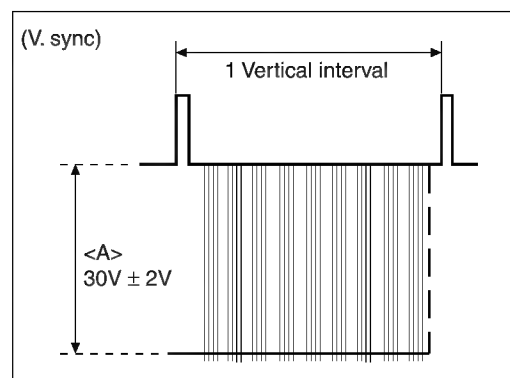
Notes:

- Perform the following adjustments after completing the 1080/60i signal Contrast adjustment.

- Set the CONTRAST data in the Setup Menu to "00".
- The SO value (see the description of the HDTV Contrast Adjustment) becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (HDTV, SDTV and NTSC/PAL).

When re-adjusting the 1080/60i signal, use the SI.

- When overscan data of a signal is changed, it is required to re-adjust the underscan data of the same adjustment signal.
- When the 4:3 data of a signal is changed, it is required to re-adjust the 16:9 data of the same adjustment signal.



1. Apply the 480/60i crosshatch signal to INPUT A (Terminal Y on the Component/RGB Input Card).
2. Set the CONTRAST potentiometer on the front panel to the centre click position.
3. Connect the oscilloscope across TP-47G and TP-GND.
4. Adjust **SE01** in the Service Menu to set the voltage amplitude <A> in the figure on the right to **30 V ± 2 V**.
5. Set the ASPECT button on the front panel to ON so that the scanning size is 16:9.
6. Adjust **SN25** to set the voltage amplitude <A> to **30 V ± 2 V**.
7. Set the ASPECT button on the front panel to OFF and the UNDER SCAN button to ON to set the scanning size to underscanning for the 4:3 ratio.
8. Adjust **SM13** to set the voltage amplitude <A> to **30 V ± 2 V**.
9. Set the ASPECT button on the front panel to ON to set the scanning size to underscanning for the 16:9 ratio.
10. Adjust **SN28** to set the voltage amplitude <A> to **30 V ± 2 V**.
11. Set the ASPECT and UNDER SCAN buttons on the front panel to OFF.
12. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 11 above (see Table 2).

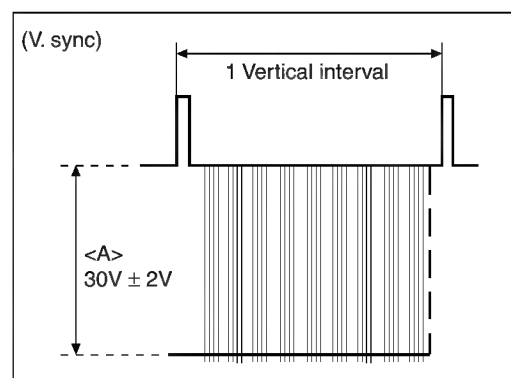
Adjustment Signal	Scanning Size	Aspect Ratio	
		4 : 3	16 : 9
480/60i	Overscan	SE01	SN25
	Underscan	SM13	SN28
576/50i	Overscan	SF01	SN31
	Underscan	SM16	SN34
480/60p	Overscan	SG01	SN37
	Underscan	SM19	SN40

Table 2

CONTRAST ADJUSTMENT (NTSC/PAL VIDEO)

Measuring Instruments	Signal generator (Crosshatch signal) Oscilloscope
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	TP-47G [CRT SOCKET PWB] TP-GND [CRT SOCKET PWB]
Adjustment Points	S*01 (4:3 Overscan Contrast), SM** (4:3 Underscan Contrast), SN** (16:9 Overscan/Underscan Contrast) [Service Menu]

- Notes:**
- Ensure that the output waveforms from the NTSC/PAL Video Input Cards are normal before proceeding to the following adjustments (see page 72).
 - Perform the following adjustments after completing the 1080/60i signal Contrast Adjustment.
 - Set the CONTRAST data in the Setup Menu to "00".
 - The SO value (see the description of the HDTV Contrast Adjustment) becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (HDTV, SDTV and NTSC/PAL).
When re-adjusting the 1080/60i signal, use the SI. (For the adjustment of the 1080/60i signal, use the Component/RGB Input Card.)
 - When overscan data of a signal is changed, it is required to re-adjust the underscan data of the same adjustment signal.
 - When the 4:3 data of a signal is changed, it is required to re-adjust the 16:9 data of the same adjustment signal.



1. Apply the NTSC crosshatch signal to INPUT C (Terminal VIDEO1 on the NTSC/PAL Video Input Card).
2. Set the CONTRAST potentiometer on the front panel to the centre click position.
3. Connect the oscilloscope across TP-47G and TP-GND.
4. Adjust **SA01** in the Service Menu to set the voltage amplitude <A> in the figure on the right to **30 V ± 2 V**.
5. Set the ASPECT button on the front panel to ON so that the scanning size is 16:9.
6. Adjust **SN01** to set the voltage amplitude <A> to **30 V ± 2 V**.
7. Set the ASPECT button on the front panel to OFF and the UNDER SCAN button to ON to set the scanning size to underscanning for the 4:3 ratio.
8. Adjust **SM01** to set the voltage amplitude <A> to **30 V ± 2 V**.
9. Set the ASPECT button on the front panel to ON to set the scanning size to underscanning for the 16:9 ratio.
10. Adjust **SN04** to set the voltage amplitude <A> to **30 V ± 2 V**.
11. Set the ASPECT and UNDER SCAN buttons on the front panel to OFF.
12. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 11 above (see Table 3).

Adjustment Signal	Scanning Size	Aspect Ratio	
		4 : 3	16 : 9
NTSC (VIDEO)	Overscan	SA01	SN01
	Underscan	SM01	SN04
PAL (VIDEO)	Overscan	SC01	SN13
	Underscan	SM07	SN16

Table 3

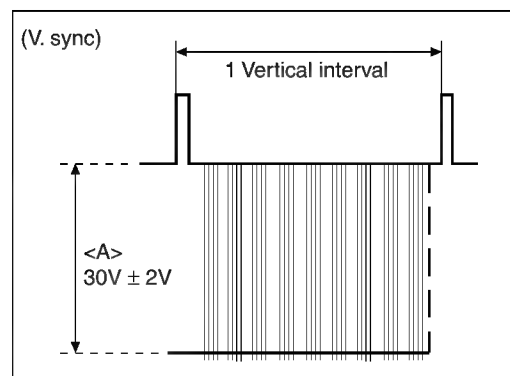
CONTRAST ADJUSTMENT (NTSC/PAL Y/C)

Measuring Instruments	Signal generator (Crosshatch signal) Oscilloscope
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	TP-47G [CRT SOCKET PWB] TP-GND [CRT SOCKET PWB]
Adjustment Points	S*01 (4:3 Overscan Contrast), SM** (4:3 Underscan Contrast), SN** (16:9 Overscan/Underscan Contrast) [Service Menu]

Notes:

- Ensure that the output waveforms from the NTSC/PAL Video Input Cards are normal before proceeding to the following adjustments (see page 72).

- Perform the following adjustments after completing the 1080/60i signal Contrast Adjustment.
- Set the CONTRAST data in the Setup Menu to "00".
- The SO value (see the description of the HDTV Contrast Adjustment) becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (HDTV, SDTV and NTSC/PAL).
When re-adjusting the 1080/60i signal, use the SI. (For the adjustment of the 1080/60i signal, use the Component/RGB Input Card.)
- When overscan data of a signal is changed, it is required to re-adjust the underscan data of the same adjustment signal.
- When the 4:3 data of a signal is changed, it is required to re-adjust the 16:9 data of the same adjustment signal.



1. Apply the NTSC crosshatch signal to INPUT D (Terminal Y/C on the NTSC/PAL Video Input Card).
2. Set the CONTRAST potentiometer on the front panel to the centre click position.
3. Connect the oscilloscope across TP-47G and TP-GND.
4. Adjust **SB01** in the Service Menu to set the voltage amplitude <A> in the figure on the right to **30 V ± 2 V**.
5. Set the ASPECT button on the front panel to ON so that the scanning size is 16:9.
6. Adjust **SN07** to set the voltage amplitude <A> to **30 V ± 2 V**.
7. Set the ASPECT button on the front panel to OFF and the UNDER SCAN button to ON to set the scanning size to underscanning for the 4:3 ratio.
8. Adjust **SM04** to set the voltage amplitude <A> to **30 V ± 2 V**.
9. Set the ASPECT button on the front panel to ON to set the scanning size to underscanning for the 16:9 ratio.
10. Adjust **SN10** to set the voltage amplitude <A> to **30 V ± 2 V**.
11. Set the ASPECT and UNDER SCAN buttons on the front panel to OFF.
12. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 11 above (see Table 4).

Adjustment Signal	Scanning Size	Aspect Ratio	
		4 : 3	16 : 9
NTSC (Y/C)	Overscan	SB01	SN07
	Underscan	SM04	SN10
PAL (Y/C)	Overscan	SD01	SN19
	Underscan	SM10	SN22

Table 4

CHROMA/PHASE ADJUSTMENTS

CHROMA/PHASE ADJUSTMENTS (COMPONENT)

Measuring Instruments	Signal generator (Component colour bar signal) Oscilloscope
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	TP-47B [CRT SOCKET PWB] TP-GND [CRT SOCKET PWB]
Adjustment Points	S*03 (Chroma), S*04 (Phase) [Service Menu]

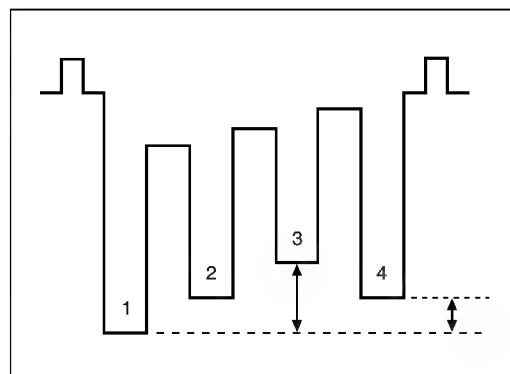
Notes:

- Perform the following adjustments after completing the Contrast adjustment.

- Set the CHROMA and PHASE data in the Setup Menu to "00".

- The value adjusted at the SO adjustment becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (Component, NTSC and PAL). When re-adjusting the 1080/60i signal, use the SI.

1. Apply the 1080/60i component colour bar signal to INPUT A.
2. Set the CHROMA and PHASE potentiometers on the front panel to the centre click positions.
3. Connect the oscilloscope across TP-47B and TP-GND.
4. Adjust **SO03** in the Service Menu to set the level difference between waveforms 1 and 4 in the figure on the right to $0\text{ V} \pm 2\text{ V}$.
5. Adjust **SO04** to set the level difference between 1 and 3 to $0\text{ V} \pm 2\text{ V}$.
6. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 5 above (see Table 5).



Adjustment Signal	Adjustment Data	
	Chroma	Phase
COMMON	SO03	SO04
1080/60i	SI03	SI04
1080/24psf	SJ03	SJ04
720/60p	SK03	SK04
480/60i	SE03	SE04
576/50i	SF03	SF04
480/60p	SG03	SG04

Table 5

CHROMA/PHASE ADJUSTMENTS (NTSC)		
Measuring Instruments	Signal generator (NTSC 75% colour bar signal) Oscilloscope	
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)	
Test Points	TP-47B [CRT SOCKET PWB] TP-GND [CRT SOCKET PWB]	
Adjustment Points	S*03 (Chroma), S*04 (Phase) [Service Menu]	

Notes:

- Ensure that the output waveforms from the NTSC/PAL Video Input Cards are normal before proceeding to the following adjustments (see page 72).
- Perform the following adjustments after completing the 1080/60i signal Chroma/Phase Adjustments.
- Set the CHROMA and PHASE data in the Setup Menu to “00”.
- The SO value (see the description of the Component Signal Chroma/Phase Adjustments) becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (Component, NTSC and PAL).
When re-adjusting the 1080/60i signal, use the SI. (For the adjustment of the 1080/60i signal, use the Component/RGB Input Card.)

1. Apply the NTSC colour bar signal to INPUT C (Terminal VIDEO1 on the NTSC/PAL Video Input Card).
2. Set the CHROMA and PHASE potentiometers on the front panel to the centre click positions.
3. Connect the oscilloscope across TP-47B and TP-GND.
4. Adjust **SA03** in the Service Menu to set the level difference between waveforms 1 and 4 in the figure on the right to **0 V ± 2 V**.
5. Adjust **SO04** to set the level difference between 1 and 3 to **0 V ± 2 V**.
6. Apply the NTSC colour bar signal to INPUT D (Terminal Y/C on the NTSC/PAL Video Input Card) and perform the adjustments in steps 2 to 5 above. See Table 6 for the adjustment data.

Adjustment Signal	Adjustment Data	
	Chroma	Phase
NTSC (VIDEO)	SA03	SA04
NTSC (Y/C)	SB03	SB04

Table 6

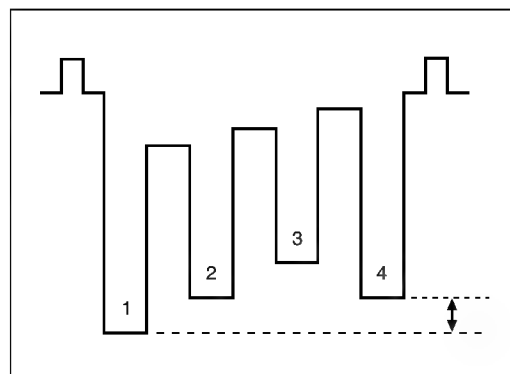
CHROMA ADJUSTMENTS (PAL)

Measuring Instruments	Signal generator (PAL 75% colour bar signal) Oscilloscope
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	TP-47B [CRT SOCKET PWB] TP-GND [CRT SOCKET PWB]
Adjustment Points	S*03 (Chroma) [Service Menu]

Notes:

- Ensure that the output waveforms from the NTSC/PAL Video Input Cards are normal before proceeding to the following adjustments (see page 72).
- Perform the following adjustments after completing the 1080/60i signal Chroma/Phase Adjustments.
- Set the CHROMA and PHASE data in the Setup Menu to "00".
- The SO value (see the description of the Component Signal Chroma/Phase Adjustments) becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (Component, NTSC and PAL). When re-adjusting the 1080/60i signal, use the SI. (For the adjustment of the 1080/60i signal, use the Component/RGB Input Card.)

1. Apply the PAL colour bar signal to INPUT C (Terminal VIDEO1 on the NTSC/PAL Video Input Card).
2. Set the CHROMA and PHASE potentiometers on the front panel to the centre click positions.
3. Connect the oscilloscope across TP-47B and TP-GND.
4. Adjust **SC03** in the Service Menu to set the level difference between waveforms 1 and 4 in the figure on the right to **0 V ± 2 V**.
5. Apply the PAL colour bar signal to INPUT D (Terminal Y/C on the NTSC/PAL Video Input Card) and perform the adjustments in steps 2 to 4 above. See Table 7 for the adjustment data.



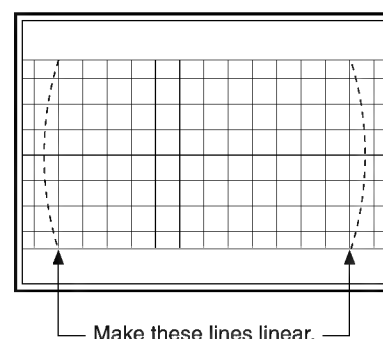
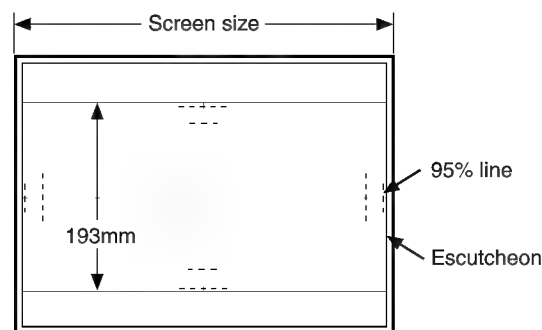
Adjustment Signal	Adjustment Data
	Chroma
PAL (VIDEO)	SC03
PAL (Y/C)	SD03

Table 7

DEFLECTION SYSTEM ADJUSTMENTS

HORIZONTAL/VERTICAL IMAGE POSITION, IMAGE AMPLITUDE AND IMAGE DISTORTION ADJUSTMENTS (HDTV OVERSCAN MODE)	
Measuring Instruments	Signal generator (Size adjustment signal, Crosshatch signal)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	D*01 (Horizontal Size), D*02 (Vertical Size), D*03 (Horizontal Position), D*04 (Vertical Position), D*05 (Side Pin Distortion), D*06 (Corner Distortion (W)), D*07 (Corner Distortion (S)), D*08 (Parallelogram Distortion), D*09 (Trapezoidal Distortion), D*10 (Horizontal Arc Distortion), D*11 (Vertical Linearity (S Correction)), D*12 (Vertical Linearity (C Correction)) [Service Menu]

1. Apply the 1080/60i size adjustment signal to INPUT A (Terminal Y on the Component/RGB Input Card).
2. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
3. Adjust **DM04** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
4. Adjust **DM02** to set the vertical amplitude of the image to **193mm**.
5. Apply the 1080/60i crosshatch signal to INPUT A.
6. Adjust **DM11** to set the sizes of the rectangles at the centre of the image and those at the left and right ends to be identical.
7. Adjust **DM12** to set the sizes of the rectangles at the centre of the image and those at the top and bottom to be identical.
8. Ensure that the centre position is not deviated. If it is, adjust **DM04** again.
9. Adjust **DM11**, **DM12** and **DM04** repeatedly until the centre position and vertical linearity are optimized.
10. Adjust **DM09** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
11. Adjust **DM08** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
12. Adjust **DM10** to optimize the horizontal arc distortion.
13. Adjust **DM05** so that the second vertical lines from the left and right edges are linear.
14. If there is an extreme corner S-shape distortion, adjust **DM07** to optimize it (this adjustment is usually unnecessary).
15. If there is an extreme corner W-shape distortion, adjust **DM06** to optimize it (this adjustment is usually unnecessary).
16. Apply the 1080/60i size adjustment signal to INPUT A.
17. Ensure that the vertical amplitude of the image is **193mm**. If it is not, adjust **DM02** again.
18. Adjust **DM03** so that the horizontal position of the image comes at the centre of the CRT screen.
19. Adjust the horizontal image amplitude with **DM01** to match the 95% line of the size adjustment signal onto the edge of the escutcheon.
20. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 19 above (see Table 8).



Adjustment Step No.	Adjustment signal	Adjustment Data
1	1080/60i	DM
2	1080/48i (24pSF)	DS
3	720/60p	DU

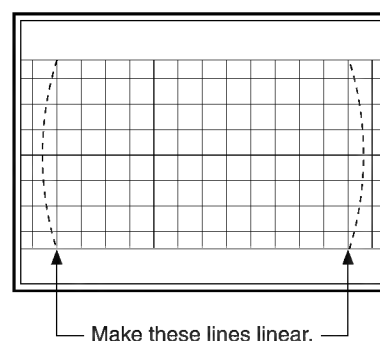
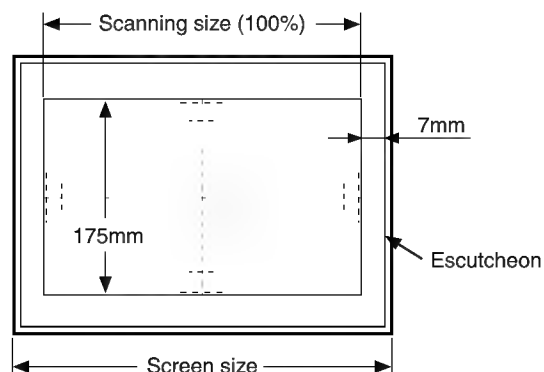
Table 8

HORIZONTAL/VERTICAL IMAGE POSITION, IMAGE AMPLITUDE AND IMAGE DISTORTION ADJUSTMENTS (HDTV UNDERSCAN MODE)

Measuring Instruments	Signal generator (Size adjustment signal, Crosshatch signal)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	D*01 (Horizontal Size), D*02 (Vertical Size), D*03 (Horizontal Position), D*04 (Vertical Position), D*05 (Side Pin Distortion), D*06 (Corner Distortion (W)), D*07 (Corner Distortion (S)), D*08 (Parallelogram Distortion), D*09 (Trapezoidal Distortion), D*10 (Horizontal Arc Distortion), D*11 (Vertical Linearity (S Correction)), D*12 (Vertical Linearity (C Correction)) [Service Menu]

Note: • Perform the following adjustments after completing the Reference Mode (HDTV overscan mode) adjustments.

1. Apply the 1080/60i size adjustment signal to INPUT A (Terminal Y on the Component/RGB Input Card).
2. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
3. Press the UNDER SCAN button on the front panel to set the scanning size to underscanning.
4. Adjust **DN04** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
5. Adjust **DN02** to set the vertical amplitude of the image to **175mm**.
6. Apply the 1080/60i crosshatch signal to INPUT A.
7. Adjust **DN11** to set the sizes of the rectangles at the centre of the image and those at the left and right ends to be identical.
8. Adjust **DN12** to set the sizes of the rectangles at the centre of the image and those at the top and bottom to be identical.
9. Ensure that the centre position is not deviated. If it is, adjust **DN04** again.
10. Adjust **DN11**, **DN12** and **DN04** repeatedly until the centre position and vertical linearity are optimized.
11. Adjust **DN09** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
12. Adjust **DN08** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
13. Adjust **DN10** to optimize the horizontal arc distortion.
14. Adjust **DN05** so that the second vertical lines from the left and right edges are linear.
15. If there is an extreme corner S-shape distortion, adjust **DN07** to optimize it (this adjustment is usually unnecessary).
16. If there is an extreme corner W-shape distortion, adjust **DN06** to optimize it (this adjustment is usually unnecessary).
17. Apply the 1080/60i size adjustment signal to INPUT A.
18. Ensure that the vertical amplitude of the image is **175mm**. If it is not, adjust **DN02** again.
19. Adjust **DN03** so that the horizontal position of the image comes at the centre of the CRT screen.
20. Adjust **DN01** to set the size adjustment signals at **7mm** from the escutcheons on the left and right side of the image.
21. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 20 above (see Table 9).



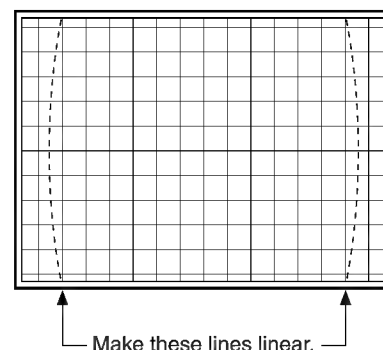
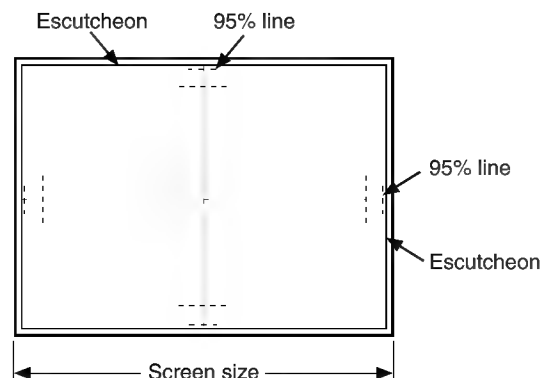
Adjustment Step No.	Adjustment signal	Adjustment Data
1	1080/60i	DN
2	1080/48i (24pSF)	DT
3	720/60p	DV

Table 9

HORIZONTAL/VERTICAL IMAGE POSITION, IMAGE AMPLITUDE AND IMAGE DISTORTION ADJUSTMENTS (SDTV OVERSCAN 4:3 MODE)

Measuring Instruments	Signal generator (Size adjustment signal, Crosshatch signal)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	D*01 (Horizontal Size), D*02 (Vertical Size), D*03 (Horizontal Position), D*04 (Vertical Position), D*05 (Side Pin Distortion), D*06 (Corner Distortion (W)), D*07 (Corner Distortion (S)), D*08 (Parallelogram Distortion), D*09 (Trapezoidal Distortion), D*10 (Horizontal Arc Distortion), D*11 (Vertical Linearity (S Correction)), D*12 (Vertical Linearity (C Correction)) [Service Menu]

1. Apply the 480/60i size adjustment signal to INPUT A (Terminal Y on the Component/RGB Input Card).
2. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
3. Adjust **DE04** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
4. Adjust the horizontal image amplitude with **DE02** to match the 95% line of the size adjustment signal onto the edge of the escutcheon.
5. Apply the 480/60i crosshatch signal to INPUT A.
6. Adjust **DE11** to set the sizes of the rectangles at the centre of the image and those at the left and right ends to be identical.
7. Adjust **DE12** to set the sizes of the rectangles at the centre of the image and those at the top and bottom to be identical.
8. Ensure that the centre position is not deviated. If it is, adjust **DE04** again.
9. Adjust **DE11**, **DE12** and **DE04** repeatedly until the centre position and vertical linearity are optimized.
10. Adjust **DE09** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
11. Adjust **DE08** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
12. Adjust **DE10** to optimize the horizontal arc distortion.
13. Adjust **DE05** so that the second vertical lines from the left and right edges are linear.
14. If there is an extreme corner S-shape distortion, adjust **DE07** to optimize it (this adjustment is usually unnecessary).
15. If there is an extreme corner W-shape distortion, adjust **DE06** to optimize it (this adjustment is usually unnecessary).
16. Apply the 480/60i size adjustment signal to INPUT A.
17. Observe the vertical amplitude of the image. If it is dislocated, adjust **DE02** again.
18. Adjust **DE03** so that the horizontal position of the image comes at the centre of the CRT screen.
19. Adjust the horizontal image amplitude with **DE01** to match the 95% line of the size adjustment signal onto the edge of the escutcheon.
20. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 19 above (see Table 10).



Adjustment Step No.	Adjustment signal	Adjustment Data
1	480/60i	DE
2	480/60p	DI
3	576/50i	DG

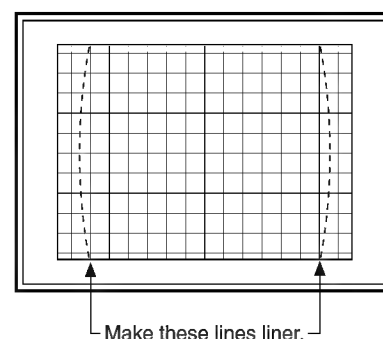
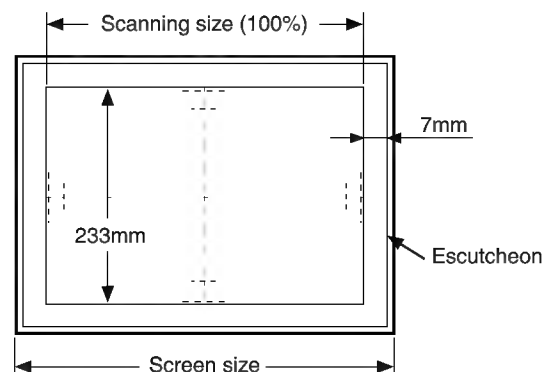
Table 10

HORIZONTAL/VERTICAL IMAGE POSITION, IMAGE AMPLITUDE AND IMAGE DISTORTION ADJUSTMENTS (SDTV UNDERSCAN 4:3 MODE)

Measuring Instruments	Signal generator (Size adjustment signal, Crosshatch signal)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	D*01 (Horizontal Size), D*02 (Vertical Size), D*03 (Horizontal Position), D*04 (Vertical Position), D*05 (Side Pin Distortion), D*06 (Corner Distortion (W)), D*07 (Corner Distortion (S)), D*08 (Parallelogram Distortion), D*09 (Trapezoidal Distortion), D*10 (Horizontal Arc Distortion), D*11 (Vertical Linearity (S Correction)), D*12 (Vertical Linearity (C Correction)) [Service Menu]

Note: • Perform the following adjustments after completing the Reference Mode (SDTV overscan 4:3 mode) adjustments.

1. Apply the 480/60i size adjustment signal to INPUT A (Terminal Y on the Component/RGB Input Card).
2. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
3. Press the UNDER SCAN button on the front panel to set the scanning size to underscanning.
4. Adjust **DF04** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
5. Adjust **DF02** to set the vertical amplitude of the image to **233mm**.
6. Apply the 480/60i crosshatch signal to INPUT A.
7. Adjust **DF11** to set the sizes of the rectangles at the centre of the image and those at the left and right ends to be identical.
8. Adjust **DF12** to set the sizes of the rectangles at the centre of the image and those at the top and bottom to be identical.
9. Ensure that the centre position is not deviated. If it is, adjust **DF04** again.
10. Adjust **DF11**, **DF12** and **DF04** repeatedly until the centre position and vertical linearity are optimized.
11. Adjust **DF09** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
12. Adjust **DF08** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
13. Adjust **DF10** to optimize the horizontal arc distortion.
14. Adjust **DF05** so that the second vertical lines from the left and right edges are linear.
15. If there is an extreme corner S-shape distortion, adjust **DF07** to optimize it (this adjustment is usually unnecessary).
16. If there is an extreme corner W-shape distortion, adjust **DF06** to optimize it (this adjustment is usually unnecessary).
17. Apply the 480/60i size adjustment signal to INPUT A.
18. Ensure that the vertical amplitude of the image is **233mm**. If it is not, adjust **DF02** again.
19. Adjust **DF03** so that the horizontal position of the image comes at the centre of the CRT screen.
20. Adjust **DF01** to set the size adjustment signals at **7mm** from the escutcheons on the left and right side of the image.
21. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 20 above (see Table 11).



Adjustment Step No.	Adjustment signal	Adjustment Data
1	480/60i	DF
2	480/60p	DJ
3	576/50i	DH

Table 11

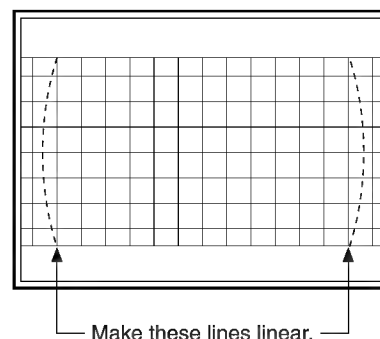
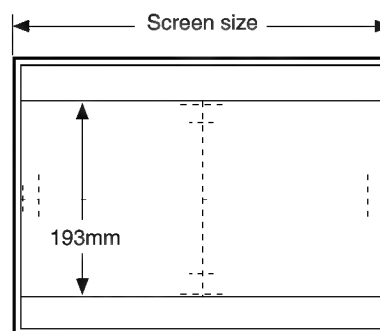
HORIZONTAL/VERTICAL IMAGE POSITION, IMAGE AMPLITUDE AND SIDE PIN DISTORTION ADJUSTMENTS (SDTV OVERSCAN 16:9 MODE)

Measuring Instruments	Signal generator (Size adjustment signal, Crosshatch signal)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	DW** (Vertical Size), DW** (Vertical Position), DW** (Side Pin Distortion), CE** (Corner Distortion (W)), CE** (Corner Distortion (S)), CE** (Parallelogram Distortion), CE** (Trapezoidal Distortion), CE** (Horizontal Arc Distortion) [Service Menu]

Notes: • Perform the following adjustments after completing the Reference Mode (SDTV overscan 4:3 mode) adjustments.

- The corner distortions (W) & (S), parallelogram distortion, trapezoidal distortion and horizontal arc distortion adjustment data for this adjustment are common to those in the SDTV overscan 16:9 mode and the SDTV underscan 16:9 mode adjustments. This adjustment data needs to be adjusted in either mode.
- The corner distortions (W) & (S), parallelogram distortion, trapezoidal distortion and horizontal arc distortion adjustment data for this adjustment are common to those in the 480/60i and NTSC signal or 576/50i and PAL signal adjustments. This adjustment data needs to be adjusted with either signal.

1. Apply the 480/60i size adjustment signal to INPUT A (Terminal Y on the Component/RGB Input Card).
2. Press the ASPECT button on the front panel to set the scanning size to 16:9 mode.
3. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
4. Adjust **DW14** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
5. Adjust **DW13** to set the vertical amplitude of the image to **193mm**.
6. Apply the 480/60i crosshatch signal to INPUT A.
7. Adjust **CE08** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
8. Adjust **CE07** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
9. Adjust **CE09** to optimize the horizontal arc distortion.
10. Adjust **DW15** so that the second vertical lines from the left and right edges are linear.
11. If there is an extreme corner S-shape distortion, adjust **CE06** to optimize it (this adjustment is usually unnecessary).
12. If there is an extreme corner W-shape distortion, adjust **CE05** to optimize it (this adjustment is usually unnecessary).
13. Apply the 480/60i size adjustment signal to INPUT A.
14. Ensure that the vertical amplitude of the image is **193mm**. If it is not, adjust **DW13** again.
15. Adjust **DW14** so that the vertical position of the image comes at the centre of the CRT screen.
16. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 15 above (see Table 12).



Adjustment Step No.	Adjustment Signal	Adjustment Data							
		Vertical Position	Vertical size	Side Pin Distortion	Corner Distortion (W)	Corner Distortion (S)	Parallelogram Distortion	Trapezoidal Distortion	Horizontal Arc Distortion
1	480/60i	DW14	DW13	DW15	CE05	CE06	CE07	CE08	CE09
2	480/60p	DW26	DW25	DW27	CE15	CE16	CE17	CE18	CE19
3	576/50i	DW20	DW19	DW21	CE10	CE11	CE12	CE13	CE14

Table 12

HORIZONTAL/VERTICAL IMAGE POSITION, IMAGE AMPLITUDE AND SIDE PIN DISTORTION ADJUSTMENTS (SDTV UNDERSCAN 16:9 MODE)

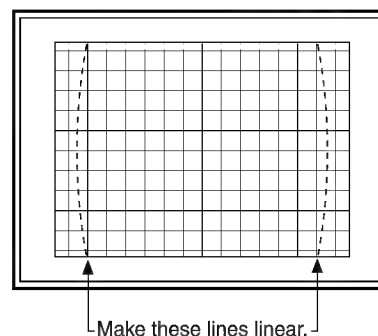
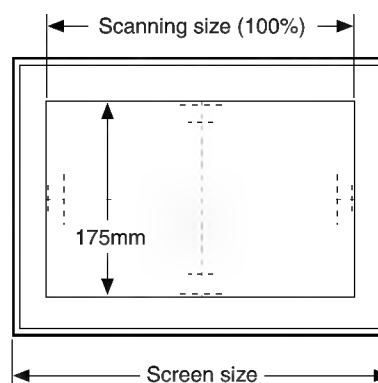
Measuring Instruments	Signal generator (Size adjustment signal, Crosshatch signal)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	DW** (Vertical Size), DW** (Vertical Position), DW** (Side Pin Distortion), CE** (Corner Distortion (W)), CE** (Corner Distortion (S)), CE** (Parallelogram Distortion), CE** (Trapezoidal Distortion), CE** (Horizontal Arc Distortion) [Service Menu]

Notes:

- Perform the following adjustments after completing the Reference Mode (SDTV overscan 4:3 mode) and SDTV underscan 4:3 mode adjustments.

- The corner distortions (W) & (S), parallelogram distortion, trapezoidal distortion and horizontal arc distortion adjustment data for this adjustment are common to those in the SDTV overscan 16:9 mode and the SDTV underscan 16:9 mode adjustments. This adjustment data needs to be adjusted in either mode.
- The corner distortions (W) & (S), parallelogram distortion, trapezoidal distortion and horizontal arc distortion adjustment data for this adjustment are common to those in the 480/60i and NTSC signal or 576/50i and PAL signal adjustments. This adjustment data needs to be adjusted with either signal.

1. Apply the 480/60i size adjustment signal to INPUT A (Terminal Y on the Component/RGB Input Card).
2. Press the ASPECT and UNDER SCAN buttons on the front panel to set the scanning size to underscanning for the 16:9 ratio.
3. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
4. Adjust **DW17** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
5. Adjust **DW16** to set the vertical amplitude of the image to **175mm**.
6. Apply the 480/60i crosshatch signal to INPUT A.
7. Adjust **CE08** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
8. Adjust **CE07** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
9. Adjust **CE09** to optimize the horizontal arc distortion.
10. Adjust **DW18** so that the second vertical lines from the left and right edges are linear.
11. If there is an extreme corner S-shape distortion, adjust **CE06** to optimize it (this adjustment is usually unnecessary).
12. If there is an extreme corner W-shape distortion, adjust **CE05** to optimize it (this adjustment is usually unnecessary).
13. Apply the 480/60i size adjustment signal to INPUT A.
14. Ensure that the vertical amplitude of the image is **175mm**. If it is not, adjust **DW16** again.
15. Adjust **DW17** so that the vertical position of the image comes at the centre of the CRT screen.
16. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 15 above (see Table 13).

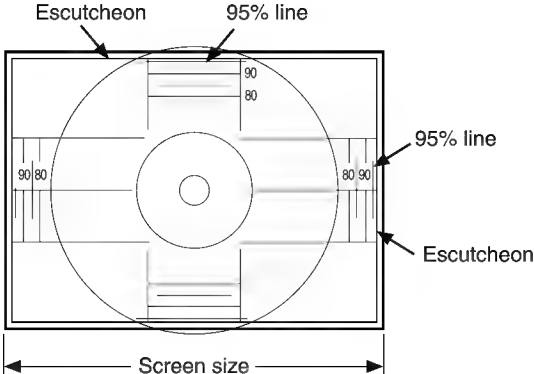


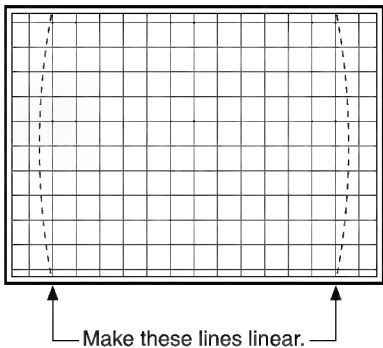
Adjustment Step No.	Adjustment Signal	Adjustment Data							
		Vertical Position	Vertical size	Side Pin Distortion	Corner Distortion (W)	Corner Distortion (S)	Parallelogram Distortion	Trapezoidal Distortion	Horizontal Arc Distortion
1	480/60i	DW17	DW16	DW18	CE05	CE06	CE07	CE08	CE09
2	480/60p	DW29	DW28	DW30	CE15	CE16	CE17	CE18	CE19
3	576/50i	DW23	DW22	DW24	CE10	CE11	CE12	CE13	CE14

Table 13

HORIZONTAL/VERTICAL IMAGE POSITION, IMAGE AMPLITUDE AND IMAGE DISTORTION ADJUSTMENTS (NTSC/PAL OVERSCAN 4:3 MODE)	
Measuring Instruments	Signal generator (Mono-scope signal, Crosshatch signal)
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	
Adjustment Points	D*01 (Horizontal Size), D*02 (Vertical Size), D*03 (Horizontal Position), D*04 (Vertical Position), D*05 (Side Pin Distortion), D*06 (Corner Distortion (W)), D*07 (Corner Distortion (S)), D*08 (Parallelogram Distortion), D*09 (Trapezoidal Distortion), D*10 (Horizontal Arc Distortion), D*11 (Vertical Linearity (S Correction)), D*12 (Vertical Linearity (C Correction)) [Service Menu]

1. Apply the NTSC mono-scope signal to INPUT C (Terminal VIDEO1 on the NTSC/PAL Video Input Card).
2. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
3. Adjust **DA04** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
4. Adjust **DA02** to match the 95% line of the vertical image amplitude onto the edge of the escutcheon.
5. Apply the NTSC crosshatch signal to INPUT C.
6. Adjust **DA11** to set the sizes of the rectangles at the centre of the image and those at the left and right ends to be identical.
7. Adjust **DA12** to set the sizes of the rectangles at the centre of the image and those at the top and bottom to be identical.
8. Ensure that the centre position is not deviated. If it is, adjust **DA04** again.
9. Adjust **DA11**, **DA12** and **DA04** repeatedly until the centre position and vertical linearity are optimized.
10. Adjust **DA09** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
11. Adjust **DA08** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
12. Adjust **DA10** to optimize the horizontal arc distortion.
13. Adjust **DA05** so that the second vertical lines from the left and right edges are linear.
14. If there is an extreme corner S-shape distortion, adjust **DA07** to optimize it (this adjustment is usually unnecessary).
15. If there is an extreme corner W-shape distortion, adjust **DA06** to optimize it (this adjustment is usually unnecessary).
16. Apply the NTSC mono-scope signal to INPUT C.
17. Observe the vertical amplitude of the image. If it is dislocated, adjust **DA02** again.
18. Adjust **DA03** so that the horizontal position of the image comes at the centre of the CRT screen.
19. Adjust **DA01** to match the 95% line of the vertical the image amplitude onto the edge of the escutcheon.
20. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 19 above (see Table 14).





Adjustment Step No.	Adjustment signal	Adjustment Data
1	NTSC	DA
2	PAL	DC

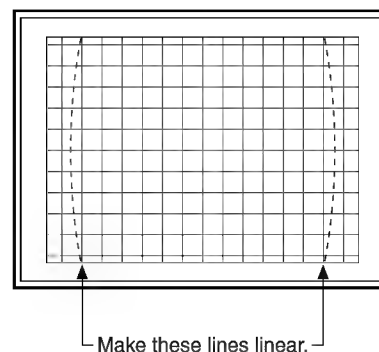
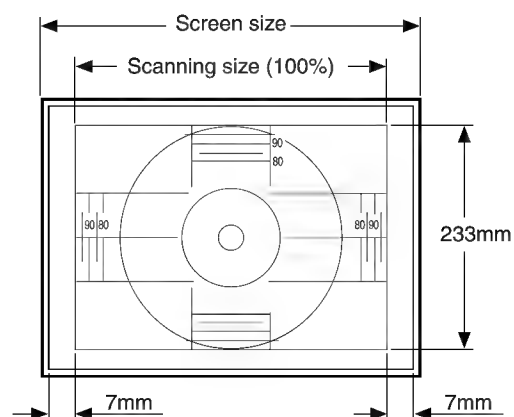
Table 14

HORIZONTAL/VERTICAL IMAGE POSITION, IMAGE AMPLITUDE AND IMAGE DISTORTION ADJUSTMENTS (NTSC/PAL UNDERSCAN 4:3 MODE)

Measuring Instruments	Signal generator (Mono-scope signal, Crosshatch signal)
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	
Adjustment Points	D*01 (Horizontal Size), D*02 (Vertical Size), D*03 (Horizontal Position), D*04 (Vertical Position), D*05 (Side Pin Distortion), D*06 (Corner Distortion (W)), D*07 (Corner Distortion (S)), D*08 (Parallelogram Distortion), D*09 (Trapezoidal Distortion), D*10 (Horizontal Arc Distortion), D*11 (Vertical Linearity (S Correction)), D*12 (Vertical Linearity (C Correction)) [Service Menu]

Note: • Perform the following adjustments after completing the Reference Mode (NTSL/PAL overscan 4:3 mode) adjustments.

1. Apply the NTSC mono-scope signal to INPUT C (Terminal VIDEO1 on the NTSC/PAL Video Input Card).
2. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
3. Press the UNDER SCAN button on the front panel to set the scanning size to underscanning.
4. Adjust **DB04** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
5. Adjust **DB02** to set the vertical amplitude of the image to **233mm**.
6. Apply the NTSC crosshatch signal to INPUT C.
7. Adjust **DB11** to set the sizes of the rectangles at the centre of the image and those at the left and right ends to be identical.
8. Adjust **DB12** to set the sizes of the rectangles at the centre of the image and those at the top and bottom to be identical.
9. Ensure that the centre position is not deviated. If it is, adjust **DB04** again.
10. Adjust **DB11**, **DB12** and **DB04** repeatedly until the centre position and vertical linearity are optimized.
11. Adjust **DB09** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
12. Adjust **DB08** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
13. Adjust **DB10** to optimize the horizontal arc distortion.
14. Adjust **DB05** so that the second vertical lines from the left and right edges are linear.
15. If there is an extreme corner S-shape distortion, adjust **DB07** to optimize it (this adjustment is usually unnecessary).
16. If there is an extreme corner W-shape distortion, adjust **DB06** to optimize it (this adjustment is usually unnecessary).
17. Apply the NTSC mono-scope signal to INPUT C.
18. Ensure that the vertical amplitude of the image is **233mm**. If it is not, adjust **DB02** again.
19. Adjust **DB03** so that the horizontal position of the image comes at the centre of the CRT screen.
20. Adjust **DB01** to set the mono-scope signals at **7mm** from the escutcheons on the left and right side of the image.
21. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 20 above (see Table 15).



Adjustment Step No.	Adjustment signal	Adjustment Data
1	NTSC	DB
2	PAL	DD

Table 15

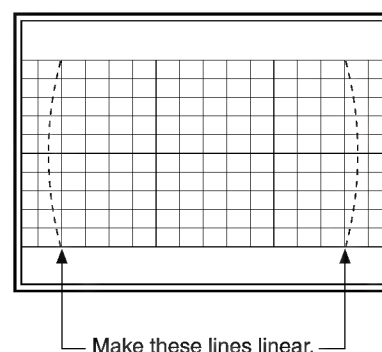
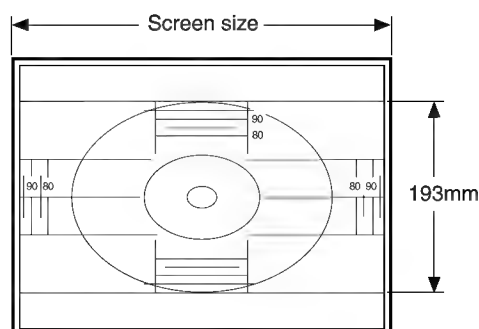
VERTICAL IMAGE POSITION, VERTICAL IMAGE AMPLITUDE AND SIDE PIN DISTORTION ADJUSTMENTS (NTSC/PAL OVERSCAN 16:9 MODE)

Measuring Instruments	Signal generator (Mono-scope signal, Crosshatch signal)
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	
Adjustment Points	DW** (Vertical Size), DW** (Vertical Position), DW** (Side Pin Distortion), CE** (Corner Distortion (W)), CE** (Corner Distortion (S)), CE** (Parallelogram Distortion), CE** (Trapezoidal Distortion), CE** (Horizontal Arc Distortion) [Service Menu]

Notes: • Perform the following adjustments after completing the Reference Mode (NTSL/PAL overscan 4:3 mode) adjustment.

- The corner distortions (W) & (S), parallelogram distortion, trapezoidal distortion and horizontal arc distortion adjustment data for this adjustment are common to those in the NTSC/PAL overscan 16:9 mode and the NTSC/PAL underscan 16:9 mode adjustments. This adjustment data needs to be adjusted in either mode.
- The corner distortions (W) & (S), parallelogram distortion, trapezoidal distortion and horizontal arc distortion adjustment data for this adjustment are common to those in the 480/60i and NTSC signal or 576/50i and PAL signal adjustments. This adjustment data needs to be adjusted with either signal.

1. Apply the NTSC mono-scope signal to INPUT C (Terminal VIDEO1 on the NTSC/PAL Video Input Card).
2. Press the ASPECT button on the front panel to set the scanning size to 16:9 mode.
3. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
4. Adjust **DW02** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
5. Adjust **DW01** to set the vertical amplitude of the image to **193mm**.
6. Apply the NTSC crosshatch signal to INPUT C.
7. Adjust **CE08** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
8. Adjust **CE07** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
9. Adjust **CE09** to optimize the horizontal arc distortion.
10. Adjust **DW03** so that the second vertical lines from the left and right edges are linear.
11. If there is an extreme corner S-shape distortion, adjust **CE06** to optimize it (this adjustment is usually unnecessary).
12. If there is an extreme corner W-shape distortion, adjust **CE05** to optimize it (this adjustment is usually unnecessary).
13. Apply the NTSC mono-scope signal to INPUT C.
14. Ensure that the vertical amplitude of the image is **193mm**. If it is not, adjust **DW01** again.
15. Adjust **DW02** so that the vertical position of the image comes at the centre of the CRT screen.
16. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 15 above (see Table 16).



Adjustment Step No.	Adjustment Signal	Adjustment Data							
		Vertical Position	Vertical size	Side Pin Distortion	Corner Distortion (W)	Corner Distortion (S)	Parallelogram Distortion	Trapezoidal Distortion	Horizontal Arc Distortion
1	NTSC	DW02	DW01	DW03	CE05	CE06	CE07	CE08	CE09
2	PAL	DW08	DW07	DW09	CE10	CE11	CE12	CE13	CE14

Table 16

VERTICAL IMAGE POSITION, VERTICAL IMAGE AMPLITUDE AND SIDE PIN DISTORTION ADJUSTMENTS (NTSC/PAL UNDERSCAN 16:9 MODE)

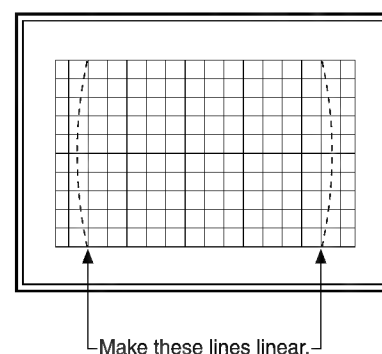
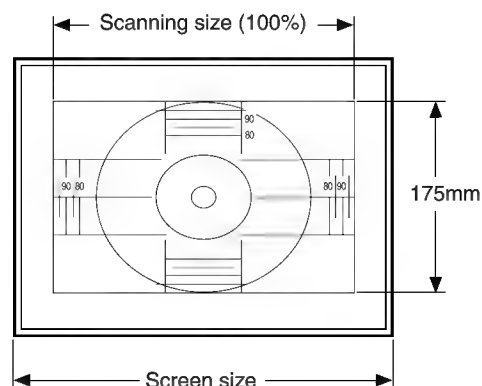
Measuring Instruments	Signal generator (Mono-scope signal, Crosshatch signal)
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	
Adjustment Points	DW** (Vertical Size), DW** (Vertical Position), DW** (Side Pin Distortion), CE** (Corner Distortion (W)), CE** (Corner Distortion (S)), CE** (Parallelogram Distortion), CE** (Trapezoidal Distortion), CE** (Horizontal Arc Distortion) [Service Menu]

Notes:

- Perform the following adjustments after completing the Reference Mode (NTSL/PAL overscan 4:3 mode) and NTSC/PAL underscan 4:3 mode adjustments.

- The corner distortions (W) & (S), parallelogram distortion, trapezoidal distortion and horizontal arc distortion adjustment data for this adjustment are common to those in the NTSC/PAL overscan 16:9 mode and the NTSC/PAL underscan 16:9 mode adjustments. This adjustment data needs to be adjusted in either mode.
- The corner distortions (W) & (S), parallelogram distortion, trapezoidal distortion and horizontal arc distortion adjustment data for this adjustment are common to those in the 480/60i and NTSC signal or 576/50i and PAL signal adjustments. This adjustment data needs to be adjusted with either signal.

1. Apply the NTSC mono-scope signal to INPUT C (Terminal VIDEO1 on the NTSC/PAL Video Input Card).
2. Press the ASPECT and UNDER SCAN buttons on the front panel to set the scanning size to underscanning for the 16:9 ratio.
3. Set the CONTRAST and BRIGHT potentiometers on the front panel to the centre click positions.
4. Adjust **DW05** in the Service Menu to set the vertical position of the image at the centre of the CRT screen.
5. Adjust **DW04** to set the vertical amplitude of the image to **175mm**.
6. Apply the NTSC crosshatch signal to INPUT C.
7. Adjust **CE08** to optimize the trapezoidal distortion (observe the second vertical lines from the left and right edges as the reference).
8. Adjust **CE07** to optimize the parallelogram distortion (observe the second vertical lines from the left and right edges as the reference).
9. Adjust **CE09** to optimize the horizontal arc distortion.
10. Adjust **DW06** so that the second vertical lines from the left and right edges are linear.
11. If there is an extreme corner S-shape distortion, adjust **CE06** to optimize it (this adjustment is usually unnecessary).
12. If there is an extreme corner W-shape distortion, adjust **CE05** to optimize it (this adjustment is usually unnecessary).
13. Apply the NTSC mono-scope signal to INPUT C.
14. Ensure that the vertical amplitude of the image is **175mm**. If it is not, adjust **DW04** again.
15. Adjust **DW05** so that the vertical position of the image comes at the centre of the CRT screen.
16. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 15 above (see Table 17).

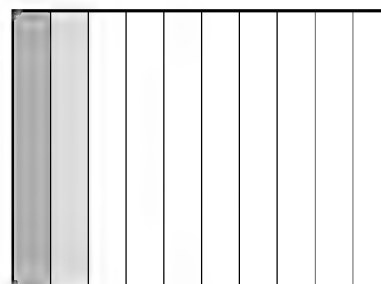
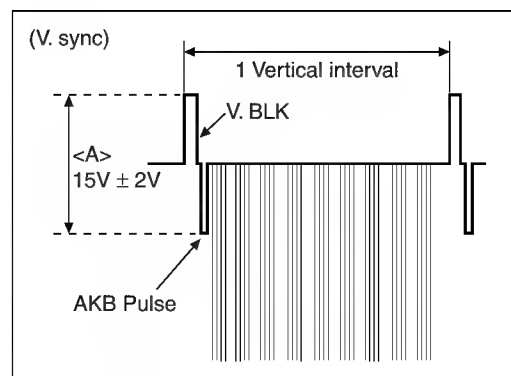


Adjustment Step No.	Adjustment Signal	Adjustment Data							
		Vertical Position	Vertical size	Side Pin Distortion	Corner Distortion (W)	Corner Distortion (S)	Parallelogram Distortion	Trapezoidal Distortion	Horizontal Arc Distortion
1	NTSC	DW05	DW04	DW06	CE05	CE06	CE07	CE08	CE09
2	PAL	DW11	DW10	DW12	CE10	CE11	CE12	CE13	CE14

Table 17

WHITE BALANCE ADJUSTMENTS

LOW-LIGHT WHITE BALANCE (REFERENCE VALUE) ADJUSTMENT	
Measuring Instruments	Signal generator (Crosshatch signal, 10-step gray scale signal) Oscilloscope
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	TP-47B [CRT SOCKET PWB] TP-GND [CRT SOCKET PWB]
Adjustment Points	W*04 (Cut Off (R)), W*05 (Cut Off (G)), W*06 (Cut Off (B)) [Service Menu]
Notes: • Perform the following adjustments after completing the screen size adjustment. • Set the COLOR TEMP/BAL. data in the Setup Menu to "00". 1. Apply the 1080/60i component crosshatch signals to INPUT A. 2. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to HIGH. 3. Set the PHASE, CHROMA, BRIGHT and CONTRAST potentiometers on the front panel to the centre click positions. 4. Connect the oscilloscope across TP-47B and TP-GND. 5. Ensure that the AKB pulse voltage <A> of the waveform at TP-47B is $15\text{V} \pm 2\text{V}$. If it is not, adjust it with the SCREEN VR potentiometer. 6. Apply the 1080/60i component 10-step gray scale signal to INPUT A. 7. Turn the BRIGHT potentiometer on the front panel gradually until the second gray step in the gray scale lights slightly. (Do not touch the SCREEN VR potentiometer.) 8. Adjust WO04, WO05 and WO06 in the Service Menu so that the gray bars are not tinted. (Do not set the values of WO04 to WO06 no more than "50".) 9. Write the data of WO04 to WO06 in WP04 to WP06 without any alteration. (Do not adjust the WP items.)	



Let this bar light up slightly

COMPONENT SIGNAL WHITE BALANCE (HIGH: D9300) ADJUSTMENTS

Measuring Instruments	Signal generator (Component 10-step gray scale signal) Colour temperature meter
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	W*01 (Drive (R)), W*03 (Drive (B)), W*04 (Cut Off (R)), W*05 (Cut Off (G)), W*06 (Cut Off (B)) [Service Menu]

Notes:

- Perform the following adjustments after completing the Low-Light White Balance Adjustment.
- Set the COLOR TEM./BAL. data in the Setup Menu to "00".
- The values adjusted with WO become the reference values for the following adjustment. When this data is changed, it is required to re-adjust the white balance data of all of the adjustment signals (Component, NTSC and PAL).
When re-adjusting the 1080/60i signal, use the WI.

1. Apply the 1080/60i component 10-step gray scale signal to INPUT A.
2. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to HIGH.
3. Set the PHASE, CHROMA, BRIGHT and CONTRAST potentiometers on the front panel to the centre click positions.
4. Adjust **WO01** and **WO03** in the Service Menu using the colour temperature meter so that the colour temperature is set as shown below.
(Do not touch **WO02**.)

Colour temperature : HIGH (D9300). $x = 0.283$, $y = 0.297$ (Reference value)

5. Ensure that the white balance tracking is correct from the gray scale steps with lower colour temperatures to those with higher colour temperatures. If the white balance tracking is deviated in darker steps, adjust **WO04** to **WO06** (Low-Light) to correct it.
(Do not set the values of **WO04** to **WO06** no more than "50".)
6. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 5 above (see Table 18).

Adjustment Signal	Function	Adjustment Data		
		R	G	B
COMMON	Drive	WO01	—	WO03
	Cut off	WO04	WO05	WO06
1080/60i (Common to 1080/24psf)	Drive	WI01	—	WI03
	Cut off	WI04	WI05	WI06
720/60p	Drive	WK01	—	WK03
	Cut off	WK04	WK05	WK06
480/60i (Common to 576/50i)	Drive	WE01	—	WE03
	Cut off	WE04	WE05	WE06
480/60p (Common to 576/50p)	Drive	WG01	—	WG03
	Cut off	WG04	WG05	WG06

Table 18

COMPONENT SIGNAL WHITE BALANCE (LOW: D65) ADJUSTMENTS

Measuring Instruments	Signal generator (Component 10-step gray scale signal) Colour temperature meter
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	W*01 (Drive (R)), W*03 (Drive (B)), W*04 (Cut Off (R)), W*05 (Cut Off (G)), W*06 (Cut Off (B)) [Service Menu]

Notes: • Perform the following adjustments after completing the Low-Light White Balance Adjustment.

- Set the COLOR TEM./BAL. data in the Setup Menu to "00".
- The values adjusted with WP become the reference values for the following adjustment. When this data is changed, it is required to re-adjust the white balance data of all of the adjustment signals (Component, NTSC and PAL).
When re-adjusting the 1080/60i signal, use the WJ.

1. Apply the 1080/60i component 10-step gray scale signal to INPUT A.
2. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to LOW.
3. Set the PHASE, CHROMA, BRIGHT and CONTRAST potentiometers on the front panel to the centre click positions.
4. Adjust **WP01** and **WP03** in the Service Menu using the colour temperature meter so that the colour temperature is set as shown below.
(Do not touch **WP02**.)

Colour temperature: LOW (D65). $x = 0.313$, $y = 0.329$ (Reference value)

5. Ensure that the white balance tracking is correct from the gray scale steps with lower colour temperatures to those with higher colour temperatures. If the white balance tracking is deviated in darker steps, adjust **WP04** to **WP06** (Low-Light) to correct it.
(Do not set the values of **WP04** to **WP06** no more than "50".)
6. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 5 above (see Table 19).

Adjustment Signal	Function	Adjustment Data		
		R	G	B
COMMON	Drive	WP01	—	WP03
	Cut off	WP04	WP05	WP06
1080/60i (Common to 1080/24psf)	Drive	WJ01	—	WJ03
	Cut off	WJ04	WJ05	WJ06
720/60p	Drive	WL01	—	WL03
	Cut off	WL04	WL05	WL06
480/60i (Common to 576/50i)	Drive	WF01	—	WF03
	Cut off	WF04	WF05	WF06
480/60p (Common to 576/50p)	Drive	WH01	—	WH03
	Cut off	WH04	WH05	WH06

Table 19

NTSC/PAL WHITE BALANCE (HIGH: D9300, LOW: D65) ADJUSTMENTS

Measuring Instruments	Signal generator (10-step gray scale signal) Colour temperature meter
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	
Adjustment Points	W*01 (Drive (R)), W*03 (Drive (B)), W*04 (Cut Off (R)), W*05 (Cut Off (G)), W*06 (Cut Off (B)) [Service Menu]

- Notes:**
- Perform the following adjustments after completing the 1080/60i White Balance (High: D9300, Low: D65) Adjustments.
 - Set the COLOR TEM./BAL. data in the Setup Menu to "00".
 - The values adjusted with WO (see the description of the White Balance (High: D9300) adjustment) become the reference values for the white balance (high: D9300) adjustment. When this data is changed, it is required to re-adjust the white balance (high: D9300) data of all of the adjustment signals (Component, NTSC and PAL).
 - The values adjusted with WP (see the description of the White Balance (Low: D65) adjustment) become the reference values for the white balance (low: D65) adjustment. When this data is changed, it is required to re-adjust the white balance (low: D65) data of all of the adjustment signals (Component, NTSC and PAL).

<HIGH: D9300>

1. Apply the NTSC 10-step gray scale signal to INPUT C (Terminal VIDEO1 of the NTSC/PAL Video Input Card).
2. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to HIGH.
3. Set the PHASE, CHROMA, BRIGHT and CONTRAST potentiometers on the front panel to the centre click positions.
4. Adjust **WA01** and **WA03** in the Service Menu using the colour temperature meter so that the colour temperature is set as shown below.
(Do not touch **WA02**.)

Colour temperature : HIGH (D9300). $x = 0.283$, $y = 0.297$ (Reference value)

5. Ensure that the white balance tracking is correct from the gray scale steps with lower colour temperatures to those with higher colour temperatures. If the white balance tracking is deviated in darker steps, adjust **WA04** to **WA06** (Low-Light) to correct it.
(Do not set the values of **WA04** to **WA06** no more than "50".)

<LOW: D65>

6. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to LOW.
7. Adjust **WB01** and **WB03** in the Service Menu using the colour temperature meter so that the colour temperature is set as shown below.
(Do not touch **WB02**.)

Colour temperature : LOW (D65). $x = 0.313$, $y = 0.329$ (Reference value)

8. Ensure that the white balance tracking is correct from the gray scale steps with lower colour temperatures to those with higher colour temperatures. If the white balance tracking is deviated in darker steps, adjust **WB04** to **WB06** (Low-Light) to correct it.
(Do not set the values of **WB04** to **WB06** no more than "50".)
9. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 8 above (see Table 20).

Adjustment Signal	Function	Adjustment Data		
		R	G	B
NTSC (Common to VIDEO and Y/C) [HIGH : D9300]	Drive	WA01	—	WA03
	Cut off	WA04	WA05	WA06
NTSC (Common to VIDEO and Y/C) [LOW : D65]	Drive	WB01	—	WB03
	Cut off	WB04	WB05	WB06
PAL (Common to VIDEO and Y/C) [HIGH : D9300]	Drive	WC01	—	WC03
	Cut off	WC04	WC05	WC06
PAL (Common to VIDEO and Y/C) [LOW : D65]	Drive	WD01	—	WD03
	Cut off	WD04	WD05	WD06

Table 20

BRIGHTNESS ADJUSTMENTS

BRIGHTNESS ADJUSTMENTS (HDTV)				
Measuring Instruments	Signal generator (Component gray scale signal)			
Card (Slot)	Component/RGB Input Card (Slot 1)			
Test Points				
Adjustment Points	S*02 (Overscan Bright High), S*06 (Overscan Bright Low), SM** (Underscan Bright High/Low) [Service Menu]			

Notes:

- Perform the following adjustments after completing the Contrast and White Balance adjustments.
- Set the SUB PICTURE ADJ. data in the Setup Menu to "00".
- The value adjusted at the SO adjustment becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (HDTV, SDTV and NTSC/PAL). When re-adjusting the 1080/60i signal, use the SI.
- When overscan data of a signal is changed, it is required to re-adjust the underscan data of the same adjustment signal.
- After completing the brightness adjustments, make sure that the Low-Light is not deviated. If it is, it is required to perform the Low-Light adjustment again.

— Standard value (SO) adjustment —

<White Balance HIGH: D9300>

1. Apply the 1080/60i component gray scale signal to INPUT A.
2. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to HIGH.
3. Set the PHASE, CHROMA, BRIGHT and CONTRAST potentiometers on the front panel to the centre click positions.
4. Adjust **SO02** in the Service Menu so that the 0% black area in the gray scale signal lights up slightly. (Be sure to avoid degradation of the black colour.)

<White Balance LOW (D65)>

5. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to LOW.
6. Adjust **SO06** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)

— Other signals adjustments —

<White Balance HIGH (D9300)>

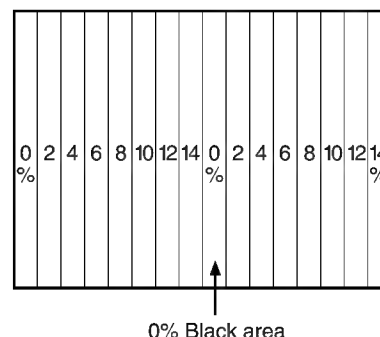
7. Apply the 1080/60i component gray scale signal to INPUT A.
8. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to HIGH.
9. Set the PHASE, CHROMA, BRIGHT and CONTRAST potentiometers on the front panel to the centre click positions.
10. Adjust **SI02** in the Service Menu so that the 0% black area in the gray scale signal lights up slightly. (Be sure to avoid degradation of the black colour.)
11. Set the UNDER SCAN button on the front panel to ON so that the scanning size is underscanning.
12. Adjust **SM26** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
13. Set the UNDER SCAN button on the front panel to OFF.

<White Balance LOW (D65)>

14. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to LOW.
15. Adjust **SI06** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
16. Set the UNDER SCAN button on the front panel to ON so that the scanning size is underscanning.
17. Adjust **SM27** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
18. Set the UNDER SCAN button on the front panel to OFF.
19. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 7 to 18 above (see Table 21).

Adjustment Signal	White Balance HIGH		White Balance LOW	
	Overscan	Underscan	Overscan	Underscan
COMMON	SO02	—	SO06	—
1080/60i	SI02	SM26	SI06	SM27
1080/24psf	SJ02	SM29	SJ06	SM30
720/60p	SK02	SM32	SK06	SM33

Table 21



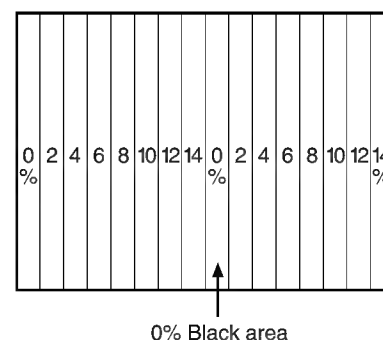
BRIGHTNESS ADJUSTMENTS (SDTV)

Measuring Instruments	Signal generator (Component gray scale signal)
Card (Slot)	Component/RGB Input Card (Slot 1)
Test Points	
Adjustment Points	S*02 (4:3 Overscan Bright High), S*06 (4:3 Overscan Bright Low), SM** (4:3 Underscan Bright High/Low), SN** (16:9 Overscan/Underscan Bright High/Low) [Service Menu]

Notes:

- Perform the following adjustment after completing the 1080/60i Brightness Adjustment.

- Set the SUB PICTURE ADJ. data in the Setup Menu to "00".
- The SO value (see the description for the HDTV Brightness adjustment) becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (HDTV, SDTV and NTSC/PAL). When re-adjusting the 1080/60i signal, use the SI.
- When overscan data of a signal is changed, it is required to re-adjust the underscan data of the same adjustment signal.
- When the 4:3 data of a signal is changed, it is required to re-adjust the 16:9 data of the same adjustment signal.
- After completing the brightness adjustments, make sure that the Low-Light is not deviated. If it is, it is required to perform the Low-Light adjustment again.



<White Balance HIGH: D9300>

1. Apply the 480/60i component gray scale signal to INPUT A.
2. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to HIGH.
3. Set the PHASE, CHROMA, BRIGHT and CONTRAST potentiometers on the front panel to the centre click positions.
4. Adjust **SE02** in the Service Menu so that the 0% black area in the gray scale signal lights up slightly. (Be sure to avoid degradation of the black colour.)
5. Set the ASPECT button on the front panel to ON so that the scanning size is 16:9.
6. Adjust **SN26** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
7. Set the ASPECT button on the front panel to OFF and the UNDER SCAN button to ON to set the scanning size to underscanning for the 4:3 ratio.
8. Adjust **SM14** so that the 0% black area in the gray scale signal lights up slightly. (Be sure to avoid degradation of the black colour.)
9. Set the ASPECT button on the front panel to ON to set the scanning size to underscanning for the 16:9 ratio.
10. Adjust **SN29** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
11. Set the ASPECT and UNDER SCAN buttons on the front panel to OFF.

<White Balance LOW (D65)>

12. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to LOW.
13. Adjust **SE06** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
14. Set the ASPECT button on the front panel to ON so that the scanning size is 16:9.
15. Adjust **SN27** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
16. Set the ASPECT button on the front panel to OFF and the UNDER SCAN button to ON to set the scanning size to underscanning for the 4:3 ratio.
17. Adjust **SM15** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
18. Set the ASPECT button on the front panel to ON to set the scanning size to underscanning for the 16:9 ratio.
19. Adjust **SN30** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
20. Set the ASPECT and UNDER SCAN buttons on the front panel to OFF.
21. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 20 above (see Table 22).

Adjustment Signal	White Balance HIGH				White Balance LOW			
	Overscan		Underscan		Overscan		Underscan	
	4 : 3	16 : 9	4 : 3	16 : 9	4 : 3	16 : 9	4 : 3	16 : 9
480/60i	SE02	SN26	SM14	SN29	SE06	SN27	SM15	SN30
576/50i	SF02	SN32	SM17	SN35	SF06	SN33	SM18	SN36
480/60p	SG02	SN38	SM20	SN41	SG06	SN39	SM21	SN42

Table 22

BRIGHTNESS ADJUSTMENTS (NTSC/PAL VIDEO)

Measuring Instruments	Signal generator (Gray scale signal)
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	
Adjustment Points	S*02 (4:3 Overscan Bright High), S*06 (4:3 Overscan Bright Low), SM** (4:3 Underscan Bright High/Low), SN** (16:9 Overscan/Underscan Bright High/Low) [Service Menu]

Notes: • Ensure that the output waveforms from the NTSC/PAL Video Input Cards are normal before proceeding to the following adjustments (see page 72).

• Perform the following adjustments after completing the 1080/60i Brightness Adjustment.

• Set the SUB PICTURE ADJ. data in the Setup Menu to "00".

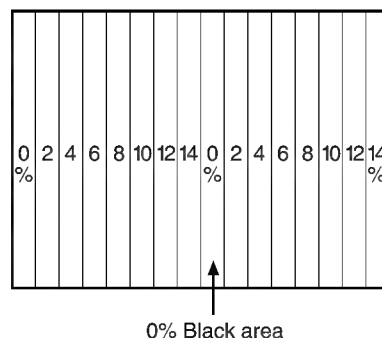
• The SO value (see the description for the HDTV Brightness adjustment) becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (HDTV, SDTV and NTSC/PAL).

When re-adjusting the 1080/60i signal, use the SI. (For the adjustment of the 1080/60i signal, use the Component/RGB Input Card.)

• When overscan data of a signal is changed, it is required to re-adjust the underscan data of the same adjustment signal.

• When the 4:3 data of a signal is changed, it is required to re-adjust the 16:9 data of the same adjustment signal.

• After completing the brightness adjustments, make sure that the Low-Light is not deviated. If it is, it is required to perform the Low-Light adjustment again.

**<White Balance HIGH: D9300>**

1. Apply the NTSC gray scale signal to INPUT C (Terminal VIDEO1 of the NTSC/PAL Video Input Card).
2. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to HIGH.
3. Set the PHASE, CHROMA, BRIGHT and CONTRAST potentiometers on the front panel to the centre click positions.
4. Adjust **SA02** in the Service Menu so that the 0% black area in the gray scale signal lights up slightly. (Be sure to avoid degradation of the black colour.)
5. Set the ASPECT button on the front panel to ON so that the scanning size is 16:9.
6. Adjust **SN02** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
7. Set the ASPECT button on the front panel to OFF and the UNDER SCAN button to ON to set the scanning size to underscanning for the 4:3 ratio.
8. Adjust **SM02** so that the 0% black area in the gray scale signal lights up slightly. (Be sure to avoid degradation of the black colour.)
9. Set the ASPECT button on the front panel to ON to set the scanning size to underscanning for the 16:9 ratio.
10. Adjust **SN05** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
11. Set the ASPECT and UNDER SCAN buttons on the front panel to OFF.

<White Balance LOW (D65)>

12. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to LOW.
13. Adjust **SA06** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
14. Set the ASPECT button on the front panel to ON so that the scanning size is 16:9.
15. Adjust **SN03** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
16. Set the ASPECT button on the front panel to OFF and the UNDER SCAN button to ON to set the scanning size to underscanning for the 4:3 ratio.
17. Adjust **SM03** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
18. Set the ASPECT button on the front panel to ON to set the scanning size to underscanning for the 16:9 ratio.
19. Adjust **SN06** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
20. Set the ASPECT and UNDER SCAN buttons on the front panel to OFF.
21. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 20 above (see Table 23).

Adjustment Signal	White Balance HIGH				White Balance LOW			
	Overscan		Underscan		Overscan		Underscan	
	4 : 3	16 : 9	4 : 3	16 : 9	4 : 3	16 : 9	4 : 3	16 : 9
NTSC(VIDEO)	SA02	SN02	SM02	SN05	SA06	SN03	SM03	SN06
PAL(VIDEO)	SC02	SN14	SM08	SN17	SC06	SN15	SM09	SN18

Table 23

BRIGHTNESS ADJUSTMENTS (NTSC/PAL Y/C)

Measuring Instruments	Signal generator (Gray scale signal)
Card (Slot)	NTSC/PAL Video Input Card (Slot 2)
Test Points	
Adjustment Points	S*02 (4:3 Overscan Bright High), S*06 (4:3 Overscan Bright Low), SM** (4:3 Underscan Bright High/Low), SN** (16:9 Overscan/Underscan Bright High/Low) [Service Menu]

Notes:

- Ensure that the output waveforms from the NTSC/PAL Video Input Cards are normal before proceeding to the following adjustments (see page 72).

- Perform the following adjustments after completing the 1080/60i Brightness Adjustment.

- Set the SUB PICTURE ADJ. data in the Setup Menu to "00".

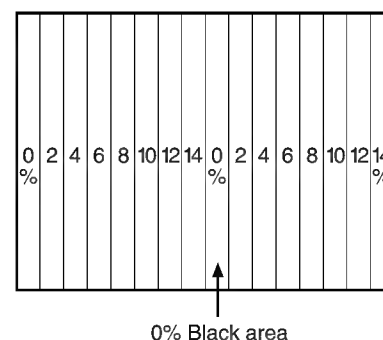
- The SO value (see the description for the HDTV Brightness adjustment) becomes the reference value for the following adjustments. When this data is changed, it is required to re-adjust the data of all of the adjustment signals (HDTV, SDTV and NTSC/PAL).

When re-adjusting the 1080/60i signal, use the SI. (For the adjustment of the 1080/60i signal, use the Component/RGB Input Card.)

- When overscan data of a signal is changed, it is required to re-adjust the underscan data of the same adjustment signal.

- When the 4:3 data of a signal is changed, it is required to re-adjust the 16:9 data of the same adjustment signal.

- After completing the brightness adjustments, make sure that the Low-Light is not deviated. If it is, it is required to perform the Low-Light adjustment again.



<White Balance HIGH: D9300>

1. Apply the NTSC gray scale signal to INPUT D (Terminal Y/C of the NTSC/PAL Video Input Card).
2. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to HIGH.
3. Set the PHASE, CHROMA, BRIGHT and CONTRAST potentiometers on the front panel to the centre click positions.
4. Adjust **SB02** in the Service Menu so that the 0% black area in the gray scale signal lights up slightly. (Be sure to avoid degradation of the black colour.)
5. Set the ASPECT button on the front panel to ON so that the scanning size is 16:9.
6. Adjust **SN08** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
7. Set the ASPECT button on the front panel to OFF and the UNDER SCAN button to ON to set the scanning size to underscanning for the 4:3 ratio.
8. Adjust **SM05** so that the 0% black area in the gray scale signal lights up slightly. (Be sure to avoid degradation of the black colour.)
9. Set the ASPECT button on the front panel to ON to set the scanning size to underscanning for the 16:9 ratio.
10. Adjust **SN11** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
11. Set the ASPECT and UNDER SCAN buttons on the front panel to OFF.

<White Balance LOW (D65)>

12. Set COLOR TEMP. of "COLOR TEMP./BAL." in the Setup Menu to LOW.
13. Adjust **SB06** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
14. Set the ASPECT button on the front panel to ON so that the scanning size is 16:9.
15. Adjust **SN09** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
16. Set the ASPECT button on the front panel to OFF and the UNDER SCAN button to ON to set the scanning size to underscanning for the 4:3 ratio.
17. Adjust **SM06** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
18. Set the ASPECT button on the front panel to ON to set the scanning size to underscanning for the 16:9 ratio.
19. Adjust **SN12** so that the 0% black area in the gray scale signal lights slightly. (Be sure to avoid degradation of the black colour.)
20. Set the ASPECT and UNDER SCAN buttons on the front panel to OFF.
21. Vary the adjustment signal and adjustment data, and re-perform adjustments in steps 1 to 20 above (see Table 24).

Adjustment Signal	White Balance HIGH				White Balance LOW			
	Overscan		Underscan		Overscan		Underscan	
	4 : 3	16 : 9	4 : 3	16 : 9	4 : 3	16 : 9	4 : 3	16 : 9
NTSC(Y/C)	SB02	SN08	SM05	SN11	SB06	SN09	SM06	SN12
PAL(Y/C)	SD02	SN20	SM11	SN23	SD06	SN21	SM12	SN24

Table 24

ADJUSTMENT OF NTSC/PAL VIDEO INPUT CARD (IF-C01PNG)

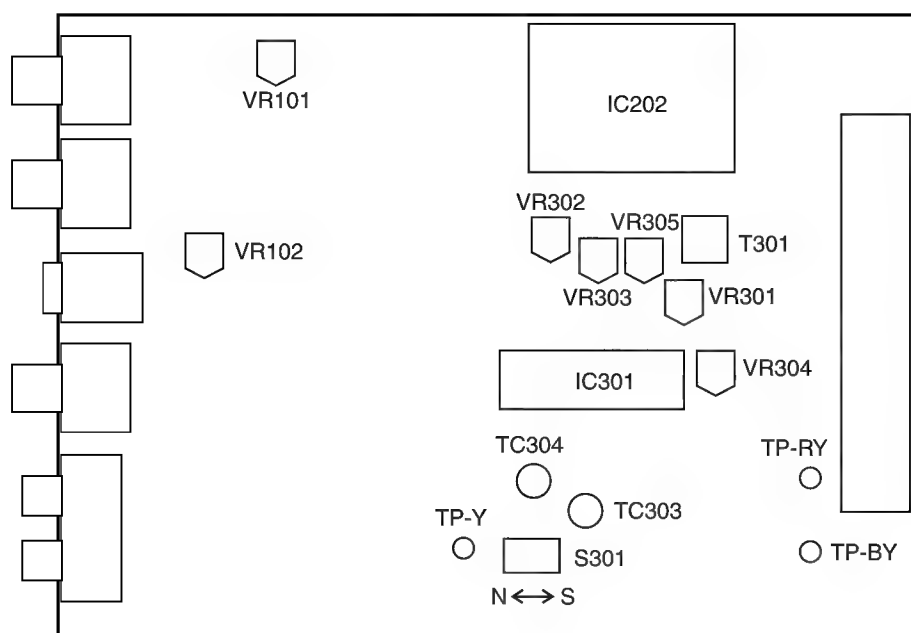
BEFORE ADJUSTMENTS

1. Warm run the set and measuring instruments sufficiently (at least 30 minutes).
2. Never touch the parts (such as variable resistors, transformer and capacitors) other than those specified in the adjustment procedures.
3. Set S301 (APC SW) to N (Normal) unless otherwise specified.

MEASURING INSTRUMENTS AND TOOLS

- Signal generator (NTSC/PAL colour bar signals)
- Oscilloscope

ADJUSTMENT LOCATIONS



VR101	: VBS AMP VR
VR102	: Y AMP VR
VR301	: LIS GAIN VR
VR302	: TINT VR
VR303	: NTSC COLOR VR
VR304	: Pr GAIN VR
VR305	: PAL COLOR VR
T301	: LIS 3 TRANSF
TC303	: PAL PHASE TRIM
TC304	: NTSC PHASE TRIM
S301	: APC SW
TP-Y	: Q208-E
TP-RY	: Q303-E
TP-BY	: Q305-E

ADJUSTMENTS OF NTSC/PAL VIDEO INPUT CARD (IF-C01PNG)

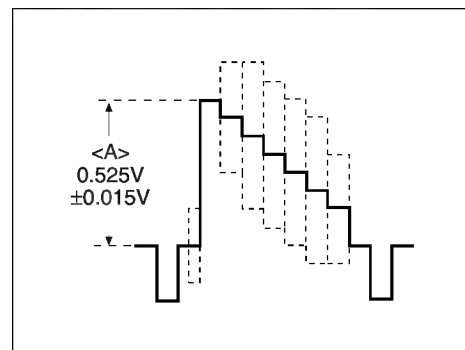
LUMINANCE SIGNAL OUTPUT LEVEL ADJUSTMENT

Measuring Instruments	Signal generator (NTSC 75% colour bar signal) Oscilloscope
Test Points	CN001 pin 1 (Y Output)
Adjustment Points	VR101 (VBS AMP VR), VR102 (Y AMP VR)

[Preparation] Supply power to the following connector (CN001) pins using a DC power supply, extension cable, etc.

CN001 pins 45, 46	14 V DC $\pm$ 1 V
CN001 pins 47, 48	7 V DC $\pm$ 1 V
CN001 pins 25 - 29, 31, 32, 35, 36, 49, 50	GND

1. Apply the NTSC colour bar signal to Terminal VIDEO1.
2. Connect the oscilloscope across CN001 pin 1 and GND.
3. Adjust **VR101** so that the voltage at <A> in the figure on the right is **0.525 V $\pm$ 0.015 V**.
4. Apply the HIGH level (3 to 5 V DC) to CN001 pin 5 and switch to the Y/C input.
5. Apply the NTSC colour bar signal to terminal Y/C.
6. Adjust **VR102** so that the voltage at <A> in the figure on the right is **0.525 V $\pm$ 0.015 V**.



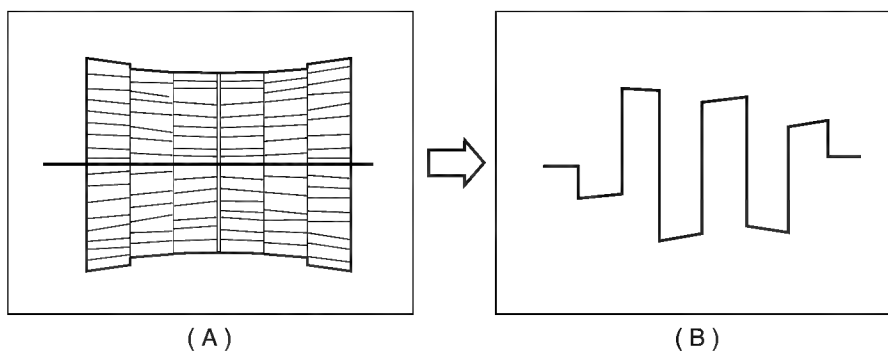
NTSC (3.58 MHz) COLOUR SYNC ADJUSTMENT

Measuring Instruments	Signal generator (NTSC 75% colour bar signal) Oscilloscope
Test Points	CN001 pin 1 (Y Output) CN001 pin 2 (B-Y output)
Adjustment Points	VR303 (NTSC COLOR VR), S301 (APC SW), TC304 (NTSC PHASE TRIM)

[Preparation] Supply power to the following connector (CN001) pins using a DC power supply, extension cable, etc.

CN001 pins 45, 46	14 V DC $\pm$ 1 V
CN001 pins 47, 48	7 V DC $\pm$ 1 V
CN001 pins 25 - 29, 31, 32, 35, 36, 49, 50	GND

1. Apply the NTSC colour bar signal to Terminal VIDEO1.
2. Connect CH1 of the oscilloscope to CN001 pin 1 and CH2 to CN001 pin 2.
3. While obtaining synchronization with the H sync with CH1, adjust **VR303** so that the CH2 waveform becomes as shown in (A) in the figure shown below.
4. Set S301 to S (Service).
5. Adjust **TC304** so that the CH2 waveform changes from (A) to (B) in the following figure. Waveform (B) should be almost stationary.
6. Set S301 to N (Normal) and ensure that the CH2 waveform is stationary.



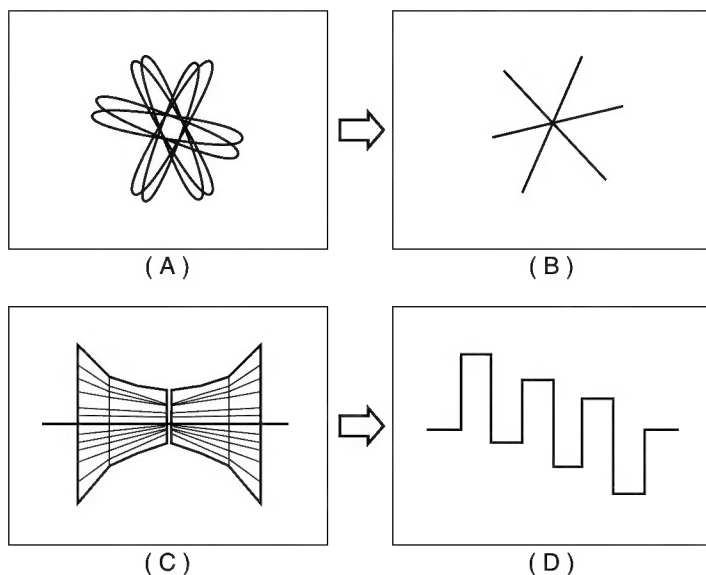
PAL COLOUR SYNC AND LISSAJOU ADJUSTMENTS

Measuring Instruments	Signal generator (PAL 75% colour bar signal) Oscilloscope
Test Points	CN001 pin 1 (Y Output) CN001 pin 2 (B-Y Output) CN001 pin 3 (R-Y Output)
Adjustment Points	S301 (APC SW), VR301 (LIS GAIN VR), VR304 (Pr GAIN VR), VR305 (PAL COLOR VR), TC303(PAL PHASE TRIM), T301 (LIS 3 TRANSF)

[Preparation] Supply power to the following connector (CN001) pins using a DC power supply, extension cable, etc.

CN001 pins 45, 46	14 V DC $\pm$ 1 V
CN001 pins 47, 48	7 V DC $\pm$ 1 V
CN001 pins 25 - 29, 31, 32, 35, 36, 49, 50	GND

1. Apply the PAL colour bar signal to Terminal VIDEO1.
2. Set S301 to S (Service).
3. Connect CH1 of the oscilloscope to CN001 pin 2 and CH2 to CN001 pin 3.
4. Adjust **VR304** and **VR305** to obtain a waveform as shown in (A) in the figure shown below.
5. Adjust **VR301** and **T301** so that the waveform changes from (A) to (B) in the following figure.
6. Connect CH1 of the oscilloscope to CN001 pin 1.
7. While obtaining synchronization with the H sync with CH1, adjust **VR304** and **VR305** so that the CH2 waveform becomes approximately as shown in (C) in the figure shown below.
8. Adjust **TC303** so that the CH2 waveform changes from (C) to (D) in the following figure. Waveform (D) should be almost stationary.
9. Set S301 to N (Normal) and ensure that the CH2 waveform is stationary.



NTSC COLOUR TINT AND DEPTH ADJUSTMENTS

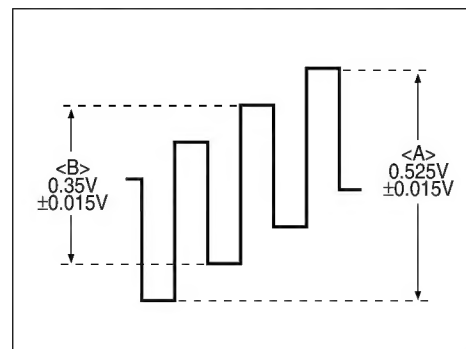
Measuring Instruments	Signal generator (NTSC 75% colour bar signal) Oscilloscope
Test Points	CN001 pin 2 (B-Y Output)
Adjustment Points	VR302 (TINT VR), VR303 (NTSC COLOR VR)

[Preparation] Supply power to the following connector (CN001) pins using a DC power supply, extension cable, etc.

CN001 pins 45, 46	14 V DC $\pm$ 1 V
CN001 pins 47, 48	7 V DC $\pm$ 1 V
CN001 pins 25 - 29, 31, 32, 35, 36, 49, 50	GND

Note: Perform the following adjustments after completing the NTSC Colour Sync adjustment.

1. Apply the NTSC colour bar signal to Terminal VIDEO1.
2. Connect the oscilloscope across CN001 pin 2 and GND.
3. Adjust **VR303** so that the voltage at <A> in the figure on the right is **0.525 V $\pm$ 0.015 V**.
4. Adjust **VR302** so that the voltage at in the figure on the right is **0.35 V $\pm$ 0.015 V**.



PAL COLOUR DEPTH ADJUSTMENT

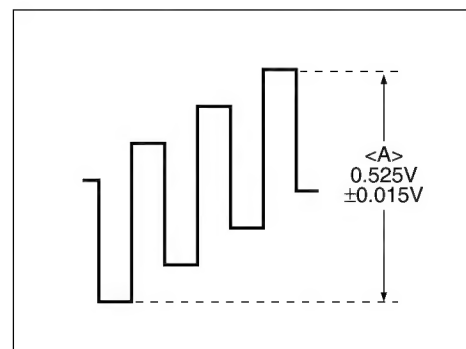
Measuring Instruments	Signal generator (PAL 75% colour bar signal) Oscilloscope
Test Points	CN001 pin 2 (B-Y Output)
Adjustment Points	VR305 (PAL COLOR VR)

[Preparation] Supply power to the following connector (CN001) pins using a DC power supply, extension cable, etc.

CN001 pins 45, 46	14 V DC $\pm$ 1 V
CN001 pins 47, 48	7 V DC $\pm$ 1 V
CN001 pins 25 to 29, 31, 32, 35, 36, 49, 50	GND

Note: Perform the following adjustments after completing the PAL Colour Sync and Lissajou adjustments.

1. Apply the PAL colour bar signal to Terminal VIDEO1.
2. Connect the oscilloscope across CN001 pin 2 and GND.
3. Adjust **VR305** so that the voltage at <A> in the figure on the right is **0.525 V $\pm$ 0.015 V**.



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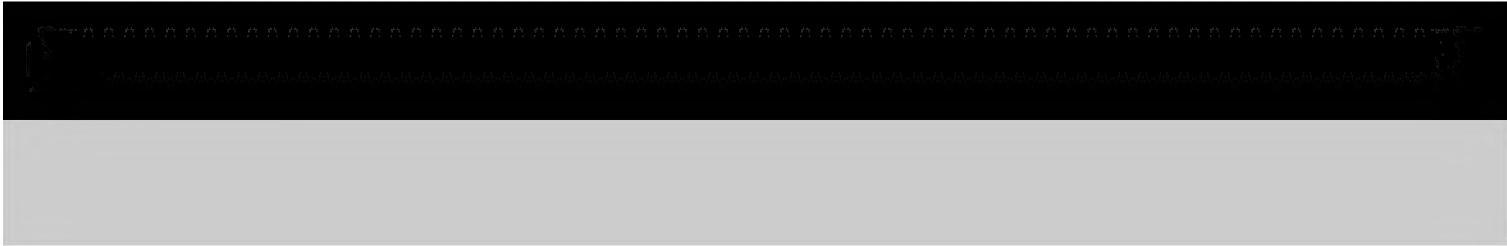
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